

JANUARY 1, 1948

EQUIPMENT FOR PRODUCTION • SERVICE • MAINTENANCE  
AUTOMOTIVE INDUSTRIES

Passenger Cars • Motor Trucks • Buses  
TRACTORS • TRAILERS • BODIES • ENGINES • AIRCRAFT  
FARM EQUIPMENT • ROAD MACHINERY • PARTS • ACCESSORIES

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Programs for Plant Expansion and Modernization

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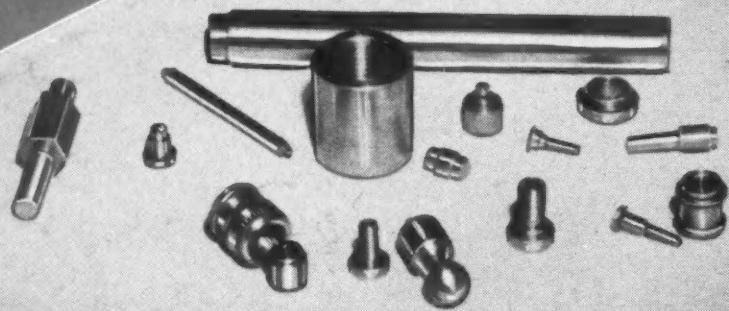
Higher Dollar Volume Output for the Aircraft Industry

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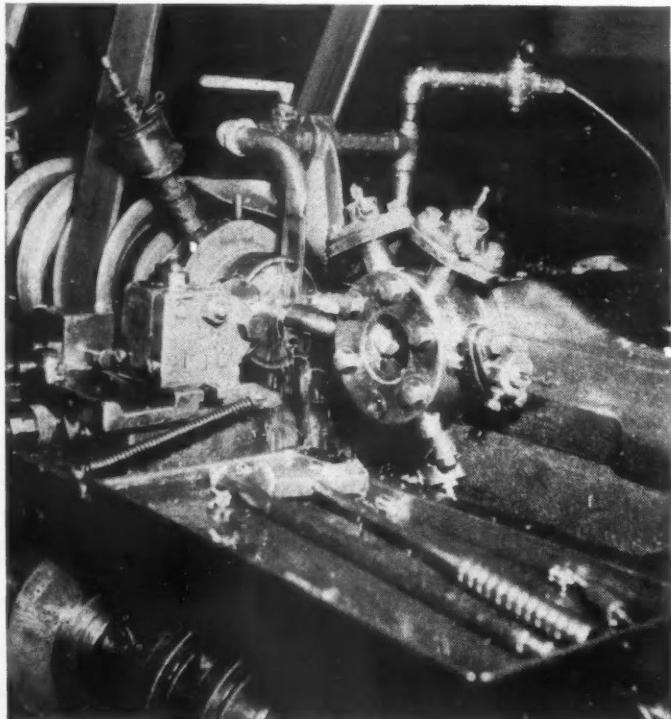
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# AUTOMOTIVE INDUSTRIES

Published Semi-Monthly

January 1, 1948

Vol. 98, No. 1

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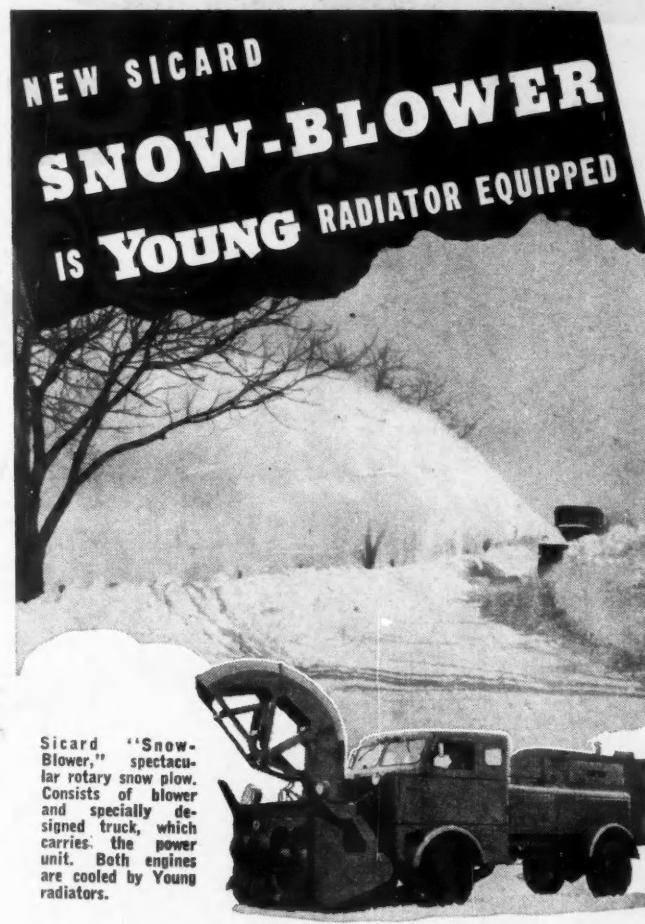
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January 1, 1948

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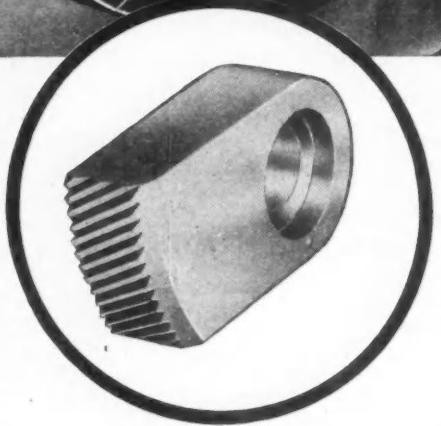
AND A COMPLETE LINE OF AIRCRAFT HEAT TRANSFER EQUIPMENT

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# SENECA FALLS Automatic WORK DRIVER

*Drives Anything  
Between Centers*

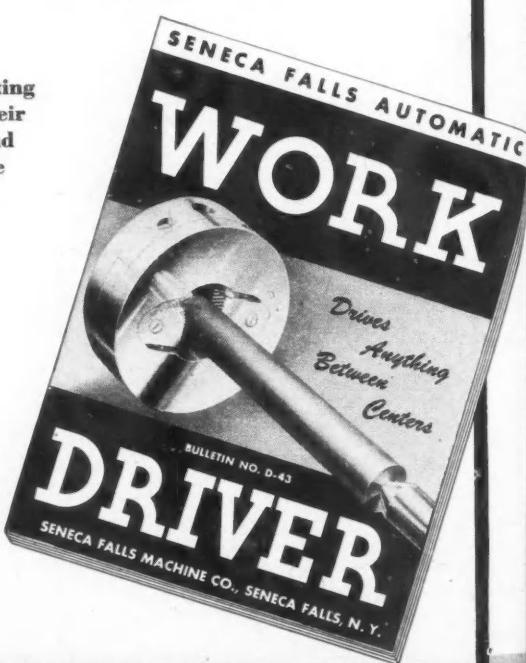


## Jaws now available with angular serrations . . .

• These self-centering, quick-acting Drivers have long demonstrated their ability to eliminate dogging time and to enable one operator to attend multiple machines. Now their application has been

widened with development of a new jaw having serrations milled at a suitable angle. These angular serrations provide an overlapping contact for surer and quicker grip on smooth finished, as well as hot rolled stock and forgings having a relatively hard surface. This positive grip eliminates slippage and resultant tool breakage...especially important when costly carbide tools are used.

Seneca Falls Work Drivers are designed for use on any engine or multiple-tool lathe and for certain work on turret lathes and grinding machines. In addition to time-saving, the Seneca Falls Automatic Work Driver provides greater safety for the operator since there are no projecting screws or sharp corners to catch clothing or injure hands. Made in 18 standardized models for work diameters ranging from  $\frac{1}{4}$  to  $6\frac{1}{8}$  inches. Write for Bulletin D-43.



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# AUTOMOTIVE INDUSTRIES

Reg. U. S. Pat. Off.

## High Spots of This Issue

### The Automobile Industry Looks Ahead

A 10 per cent increase in passenger car production is predicted in a comprehensive article on prospects of motor vehicle output for 1948, pages 24-27.

### Big Year Seen for Tractor Industry

The new year will bring an all-time record demand for products of the tractor industry. What the tractor industry is doing to meet this demand is related in an article on pages 30 and 31.

### Aircraft Manufacturers' Outlook Bright

A 20 per cent higher dollar volume output by the aircraft manufacturers is foreseen for 1948, mainly because of heavy military demands—page 32.

### New Dodge Trucks

The 1948 Dodge trucks have improved cabs, new cross-steering which permits a 37-deg turning angle, shorter wheelbases and better weight distribution. Complete details, together with a condensed table of specifications for the B-1 series, are given on pages 34 and 35.

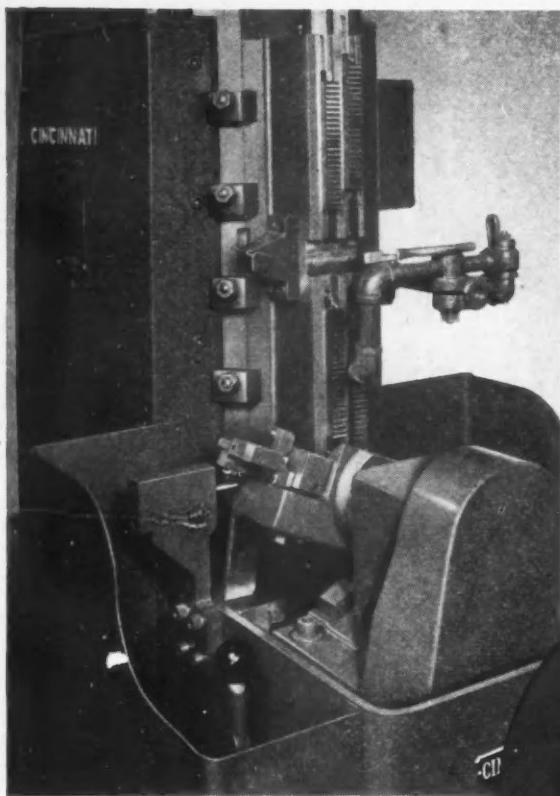
### Ford Tractor Production

Materials handling, a significant factor in any manufacturing operation, is of primary importance in tractor production at the recently centralized Ford tractor plant at Highland Park, Mich. This large building, containing about 385,000 sq ft of floor space, includes the manufacturing of virtually every element of the tractor. Joseph Geschelin describes the plant arrangement on pages 36-39.

### 23 New Product Items And Other High Spots Such As:

The automobile industry's plans for plant expansion and modernization in 1948; how some companies are stretching the steel supply by replacing steel with aluminum in passenger cars; Buick's new sheet metal plant; Grumman's 650-mph Panther fighter plane; details of the latest Checker Cab; prefabricated aluminum parts for truck bodies; and a modified Ford V-8 truck engine with an output of 175 hp.

*News of the Automotive Industries, Page 17  
For Complete Table of Contents, See Page 3*

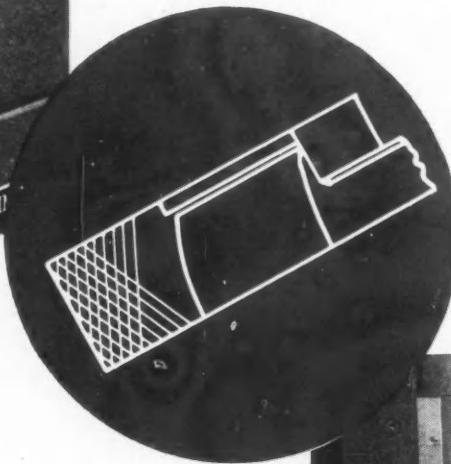


First step—Loading position  
for two plier sections.

## SPLIT-STROKE METHOD

### with rocker arm fixture

BROACHES CROSS-HATCH  
SERRATIONS ON  
PLIER JAWS

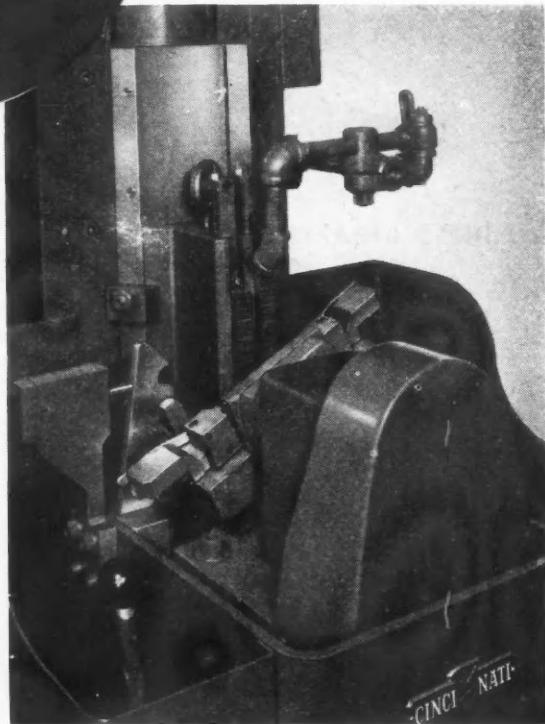


Drawing of serrations broached in plier jaws. Sequence of operations: Load two parts and start . . . broach, index, broach . . . remove two parts and return ram. Production 460 per hour.

● Take the cost reduction usually offered by broaching, double it, and you have an idea of the saving effected by the equipment illustrated here. It's a CINCINNATI No. 1-30 Single Ram Vertical Hydro-Broach, tooled up by Cincinnati Application Engineers to broach the serrations in plier jaws.

In one stroke of the ram, two serrating operations are performed, resulting in the cross-hatch effect illustrated in the drawing.

Here's the way it works. A space between the two sets of broaching inserts, shown in the photograph above, provides an interval of time, during the downward stroke of the ram, to automatically index the fixture from one cut to the next, teeter-totter fashion. ¶ A Cincinnati development, this principle is known as "split-stroke" broaching. It's one of many innovations in low-cost broaching instituted by our engineers. Perhaps it will give you an idea involving two or three operations in your own shop, which could be combined at a big reduction in cost. Our Application Engineers are at your service to work out the best method and recommend the proper equipment. Send blueprints of parts when you write for particulars.



Second step—Position of fixture  
after ram descends halfway.

## THE CINCINNATI MILLING MACHINE CO.

CINCINNATI 9, OHIO, U. S. A.

MILLING MACHINES

• BROACHING MACHINES

• CUTTER SHARPENING MACHINES

# NEWS of the AUTOMOTIVE INDUSTRIES

Vol. 98, No. 1

January 1, 1948

## Pig Iron Supply Still Short; May Limit Car Output in '48

While steel gets top billing as a principal shortage factor responsible for limited automotive production, pig iron is another material that will bear close watching this year. Reports from several automotive foundries say that the supply is critical, and that there is not much relief in sight. One thing that restricts the flow to foundries is the need for using pig to make steel, replacing part of the scrap normally used but not currently available in sufficient quantities. Production of pig is also being held down because of a shortage of good coking coal. The steel industry is moving to expand production of coke, and by the end of this year will have added about three million tons to current capacity. If steel is available to build more cars and trucks next year, more pig iron will also be required for castings, and it would not be too surprising if the latter should prove a stumbling block to full capacity output of vehicles. In an effort to relieve the critical scrap supply, a fact-finding commission composed of representatives of government and industry will soon go to Germany to determine whether iron and steel scrap supplies under the jurisdiction of the U. S. Army might be returned to this country.

## Hudson to Roll Steel Sheets At Newly-Leased Plant

Two-thirds of the former Shenango tin plate plant of the Carnegie-Illinois Steel Corp. at New Castle, Pa., has been leased by the Hudson Motor Car Co. from the WAA. The plant, which has a total of 625,000 sq ft, will be used by Hudson to make steel sheets for automobile bodies. Expecting to begin production within three months, Hudson reportedly has equipment to roll over 100,000 tons of sheet per year. The lease will extend for either four or five years at a rental of \$110,000 a year with an option for renewal, it is understood.

Now rolling off two assembly lines at an average rate of about 2000 cars a week, the new Hudson is being produced in a brougham model, and it is expected that pro-

duction of the club coupe will start soon. Initial production involved four-door sedan models. Over 15,000 persons are now employed by Hudson in producing the new car.

## Packard Making Arrangements To Boost Sheet Steel Supply

Packard has a deal underway to greatly augment its supply of sheet steel for next year, and if arrangements are successful will be able to build 50 per cent more cars than it turned out in 1947, according to George T. Christopher, president. He did not divulge details, but reports from other sources say that the company will buy or lease a steel mill, making it the third independent to take that course of action within two

months. Kaiser-Frazer purchased a rolling mill last fall, in addition to its interest in an Ohio steel mill. Hudson and Studebaker have also acquired steel rolling facilities recently. Ford has been producing part of its steel requirements for many years at the Rouge. He said that Packard ended last year in the best relative financial position of any automobile manufacturer, not with reference to number of dollars, but to relation of assets to liabilities. He added that Packard at year-end had working capital of about \$25 million, and no outstanding obligations in the way of loans or bonds. Commenting to the press later, Mr. Christopher said that although steel would not be a problem in 1948 after the arrangements for a new source were completed, pig iron might possibly hamper production. He dropped a hint, however, "that we might have something to say about that too, a little later on."

## WORDS OF APPRECIATION

Beginning with this, the first one of a promising new year, the semi-monthly issues of AUTOMOTIVE INDUSTRIES will appear under new and modernized covers. This forward step in the long publishing history of The Industrial News Authority Devoted to Automotive Products for Land, Air and Water, whose roots run back to the very beginning of things automotive, is made possible to a determining extent by the splendid and much appreciated cooperation of the Timken Roller Bearing Co. and the New Departure Division of General Motors. As our readers well know, these two highly esteemed, outstanding companies have been regular alternating advertisers on the front covers of AUTOMOTIVE INDUSTRIES for many years—for something like 25 years in one case and for 20 years in the other. They both most graciously relinquished their clearly earned claims to the front cover position for their advertising and, in return, new and special positions have been provided for them. We wish hereby, and in this manner publicly, to express our thanks to them.

## New Futuramic Model to Mark Oldsmobile's 50th Anniversary

GM's Oldsmobile Div. will mark its 50th Anniversary with an entirely new model in the 98 series. To be shown in February, the new model is described as the Futuramic. Featuring a brand new GM Fisher body, with completely new styling throughout, the new Oldsmobile will have lower wider lines, increased window area and added horsepower. In addition to the new Futuramic Series 98, which will include a four-door, a two-door and a convertible model, Oldsmobile will also produce two colorful new Dynamic Series, the 60 and the 70 for 1948. All three Oldsmobile lines will offer GM Hydramatic Drive as optional equipment.

## Nash Nets \$18,097,697 for Year Ending Sept. 30th

Nash-Kelvinator Corp. and its subsidiaries had a net profit of \$18,097,697 for the fiscal year ending Sept. 30, 1947; this compares with a net profit of \$2,582,273, including a tax carryback credit of \$1,080,000 for the same period a year ago. In the two years, net sales were \$250,262,581 and \$121,556,012.

During the last two years, Nash-

# NEWS of the AUTOMOTIVE INDUSTRIES



Kelvinator Corp. has spent about \$26 million for its expansion and modernization program, and will spend an additional \$15 million this year to offset higher material and labor costs through increased efficiency. Nash built 115,914 cars during the year, compared with 72,861 for the same period in 1946.

## GM Announces New 1948 Bus With 41-45 Passenger Capacity

Designated as the PDA-4101, a new 1948 41-45 passenger intercity coach has been announced by GM's GMC Truck & Coach Div. Powered by a six-cyl, 200-hp Diesel engine mounted transversely in the rear, the new bus has an overall length of 35 ft and a wheelbase of 247 in. Changing the seating arrangements gives 37-passenger capacity with de luxe reclining seats; 41-passenger capacity with full reclining seats; or 45-passenger capacity with non-reclining seats. The new coach weighs 18,850 lb, and production, it is expected, will start soon with delivery scheduled for 1948.

## International Harvester Price Raises Average 5%

Averaging five per cent, price raises on most International Harvester Co. products have been made necessary by increased costs of materials, wages and transportation, John L. McCaffrey, president, disclosed recently. Amounting to two per cent more than prices in effect March 9, 1947, when IHC reduced prices, price increases are 6.4 per cent to 12.8 per cent on farm tractors; 1.4 per cent to 19.8 per cent on farm implements; 4.1 per cent to 19.3 per cent on industrial power products; and 1.9 per cent to 4.9 per cent

on light and medium motor trucks. Prices of the new Cub tractor, the Farmall tractor, the mechanical cotton picker, and all heavy duty motor trucks remain the same, and the price of the new sugar beet harvester is being reduced.

## Dearborn Motors Corporation To Manufacture New Combine

Dearborn Motors Corp. will build a new combine starting early in 1948 at the Woods Bros. plant in Des Moines, Iowa, which Dearborn Motors recently acquired. The new implement will be sold through Ford tractor dealers.

## Ford Motor of Canada Hits Record Peacetime Output in '47

Indications are that 1947 will be the best peacetime production year Ford Motor Co. of Canada, Ltd., has yet experienced. It is expected that net sales will hit \$135 million as against last year's \$101 million. The

prewar sales high was in 1929 when sales totaled \$59,840,536, but currently higher car and truck prices as well as larger spare parts volume should be taken into account in any comparisons. However, it is anticipated that 110,000 cars and trucks will be produced in 1947 by Ford of Canada as contrasted with 1929's record of 100,660. Approximately 60 per cent of 1947 sales have been in Canada, with the balance exports, principally to areas within the British Empire.

## Estimate \$19 Million Income For Kaiser-Frazer in 1947

Forecasting Kaiser-Frazer net earnings for 1947 at about \$19 millions, Edgar F. Kaiser, vice president and general manager, further estimated that production for 1947 would total 145,000 cars, and that 1948 production would approximate 300,000 cars. He indicated that plans are being advanced for a K-F assembly plant at Long Beach, Calif.

More sheet steel seems to be on the way for K-F, with the announcement that Portsmouth Steel Co., in which K-F has a substantial interest, has purchased a steel mill from John P. Ludgate Associates, Pittsburgh for about \$275,000. Now being moved from Sault Ste. Marie, Ont., to Portsmouth, Ohio, the equipment is capable of producing 100,000 tons a year.

## Demand for Sheet Aluminum Forces Order Curtailment

The extensive substitutions of aluminum for steel, currently in short supply, has led to such an excessive demand for aluminum sheets



## LOGGING LEVIATHAN

Recently displayed at the Pacific Logging Congress in Seattle, the Kenworth Model 584, a logging truck giant, measures 128.5 in. to the top of the exhaust stack and is equipped with tires measuring 14.00 x 24. Featuring power steering and a SD-472 Timken axle, the pilot model is powered by a Hall-Scott 400 engine.

# NEWS of the AUTOMOTIVE INDUSTRIES

that the Aluminum Co. of America recently stopped taking orders for a period of one month. The company said it was acting to protect its regular customers and to curb speculative buying. The action suggests that although automobile manufacturers are currently substituting aluminum for sheet steel to some degree, the available supply may dictate the extent to which they may go in that direction.

## Commerce Dept. Sees 6 Million Cars & Trucks in U. S. in '48

Commerce Dept. estimates of automotive production this year do not square with even the most optimistic viewpoints so far recorded by the people who have to make the vehicles. The Department looks for about five million passenger cars and one million trucks to be built in the U. S. this year. That estimate conflicts sharply, at least so far as passenger car output is concerned, with the known viewpoint of some automobile company spokesmen who are looking for an increase of from 10 to 15 per cent above last year, which would be from 5,225,000 to 5,462,000 units. In fact, there are reports now that those estimates may be a little on the fat side in view of possible government allocation of steel and diversion of more steel to Europe under the Marshall Plan this year.

## European Truck Builders Plan Million Units in Next 4 Years

According to the Harriman report, European manufacturers plan to build 1,175,000 trucks for domestic use, and about 125,000 for export during the four-year period 1948 through 1951. The committee said that in view of production performance last year, it believes that the goal will be reached. It also said it considered the truck building program not to be excessive, and recommended that steel for it be made available. It also urged that consideration be given to importing some finished trucks in 1948 and 1949 to reduce the strain on European transportation facilities.

## Fleet Mfg. To Make Buses In Canada for Twin Coach

Fleet Manufacturing & Aircraft Ltd., and the Twin Coach Co., which operates a plant in Buffalo, have entered into an agreement for the manufacture of aluminum alloy mo-

tor buses in Fleet's Ft. Erie, Ont., plant. Fleet will manufacture the buses for Twin Coach, which will handle the sales and service of the buses produced in Canada through a newly-established Canadian company known as Twin Coach of Canada Ltd. The Ft. Erie plant will be equipped to produce all models, which will be called Twin Coaches. The agreement calls for the production of one bus a day, but this will be increased to two a day. At full production, employment in the Fleet bus unit will approximate 400 or 500.

## Edward Fisher Buys Interest In Gar Wood Industries, Inc.

An extensive reorganization of Gar Wood Industries, Inc., management and organizational setup has resulted from the purchase of a \$1.5 million interest in the company by Edward Fisher of the Fisher family of Detroit. All sales of the many units of Gar Wood will now be integrated under the supervision of a centralized staff. Changes are also scheduled in manufacturing, production, engineering, accounting, and



## FIRST OF FOUR

Located on an 82 acre plot, Ford Motor Co.'s new branch assembly plant at Hapeville, Ga., the first of four new Ford assembly plants to be completed, will have a production capacity of 350 cars and trucks a day when fully operating early in 1948.

## Tire Production to Drop Below High Level of '47

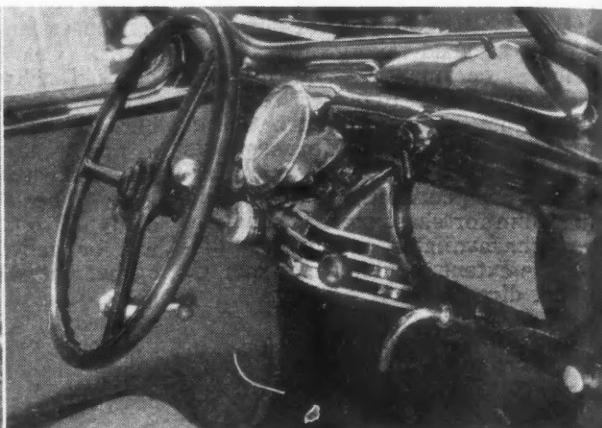
The rubber industry is looking for somewhat lower production of tires this year, according to Herbert E. Smith, president, U. S. Rubber Tire Co. He said that tire production in 1947 hit an all-time high just short of 100 million casings. Production this year is estimated at 83 million tires. The industry expects to use about 905,000 long tons of natural and synthetic rubber in 1948, which is a drop from the all-time high consumption of 1,110,000 long tons in 1947. Last year, consumption of natural rubber exceeded synthetic for the first time since 1943, he said. The proportion will be increased this year to about 61 per cent, or 550,000 long tons of natural and 350,000 long tons of synthetic.

finance. Operations will be consolidated into three major divisions at Wayne, Mich.; Findlay, Ohio, and St. Paul, Minn. Charles W. Perelle, who assumed the presidency in 1946, has also acquired a \$150,000 interest in the company.

## Fairchild Begins Experiments On Atomic Powered Aircraft

While atomic energy for use in powering aircraft is thought to be many years away, experimental work has passed the paper stage, and is now in the phase of actual experimentation. Fairchild Engine & Airplane Corp. has revealed that it is conducting experiments on atomic energy aircraft engines under a contract with the U. S. Air Forces. The National Advisory Committee on Aeronautics is participating in the work. It is believed that the project

# NEWS of the AUTOMOTIVE INDUSTRIES



## PRODUCED UNDERGROUND

Built during the war by the F. Janecek firm under the program of the Czechoslovakian industrial underground movement, the Minor, now being produced by the Aviation Works, National Corp., Prague, features a front wheel drive with the engine

forward of the front driving axle. The two-cyl, two-stroke engine develops 20 hp, and the car has a maximum speed over 50 mph. This car was fully described in the Nov. 15 issue of *AUTOMOTIVE INDUSTRIES*, page 24.

is a long range one and that experimentation probably centers around heat transfer and shielding from radiation, which are principal obstacles to practical use of atomic energy.

### ASTM To Hold Tractor Fuel Forum in Chicago, Jan. 9

A forum on tractor fuels will be held in Chicago on Jan. 9 sponsored by Committee D-2 on Petroleum Products and Lubricants of the American Society for Testing Materials.

### Albatross Amphibian Plane Test Flown by Navy

Designed for operating in rough water in waves up to 4.5 ft in height, the Grumman Albatross, a new amphibious twin-engined transport plane, was recently test flown successfully by the Navy. The plane has a maximum speed of 270 mph and a maximum range of over 2600 mi. It can carry 16 passengers or over 4100 lb of cargo. Powered by two Wright 1425-hp engines equipped with three-bladed Hamilton Standard propellers, the plane has auxiliary

rocket-power units, making take-offs possible from water in 12 sec. It has a wing span of 80 ft, and is 61 ft long.

### Willys' Net is \$3,367,792 For Year Ending Sept. 30, 1947

Constituting the largest peacetime earnings since 1928, a \$3,367,792 net profit was announced by Willys-Overland Motors, Inc., for the fiscal year ending Sept. 30, 1947. For the previous fiscal year ending on Sept. 30, 1946, the net profit was \$402,901, after effecting a tax carryback credit of \$854,410. Net sales of \$138,123,594 of jeeps, station wagons, trucks, parts and forgings for the fiscal year ending last September contrast with \$60,240,989 for the previous year period. During the year Willys produced 113,602 vehicles.

### NEW TRUCK REGISTRATIONS\*

Arranged by Makes in Descending Order According to the Ten Months' 1947 Totals

MAKE	October 1947	September 1947	October 1946	TEN MONTHS		Per Cent of Total
				Units	1947	
Chevrolet.....	25,970	19,848	23,272	183,352	129,337	24.85
Ford.....	17,142	14,521	17,732	170,582	102,800	23.12
Dodge.....	11,801	9,418	7,982	108,260	79,289	14.68
International.....	11,390	9,608	9,258	95,622	64,388	12.96
Willys.....	4,822	4,579	5,201	40,488	34,915	5.49
G. M. C. ....	4,672	2,279	3,356	40,115	17,792	5.44
Studebaker.....	3,889	3,414	2,874	34,935	19,970	4.73
White.....	1,275	1,053	1,125	11,010	7,779	1.49
Reo.....	1,080	825	1,227	10,926	8,103	1.48
Mack.....	1,215	977	108	9,128	4,382	1.24
Diamond T.....	1,080	925	560	8,854	3,930	1.20
Federal.....	598	569	387	4,985	3,862	.87
Diveco.....	612	445	392	4,118	3,052	.56
Autocar.....	378	282	444	3,751	3,645	.51
Brockway.....	412	314	313	3,611	3,014	.49
Hudson.....	97	196	178	2,490	2,120	.34
F. W. D. ....	102	104	48	998	455	.14
Sterling.....	64	29	48	998	436	.07
Ward La France.....	42	28	.....	441	.....	.06
Oshkosh.....	11	24	.....	199	.....	.03
All Others.....	515	463	243	3,342	2,780	.45
Total.....	87,167	69,899	74,708	737,705	491,817	100.00
						100.00

\*Data from R. L. Polk & Co.

### Ryan Gets \$1,070,000 More To Develop USAF Guided Missile

The U.S. Air Force has increased by \$1,070,000 its already substantial commitments with Ryan Aeronautical Co. for the development and manufacture of a new type of controlled weapon. This is the third time that the USAF has increased its contract. Details of the guided missile are not available, but it has been described as one of the most compact weapons of its type, and features a "built-in brain capable of doing its own thinking" once it has been launched.

# NEWS of the AUTOMOTIVE INDUSTRIES

## Auto-Lite Buys Part of WAA's Wright Plant in Ohio

A portion of the surplus Wright Aeronautical Corp. plant in Lockland, Ohio, has been sold for \$8.4 million to the Electric Auto-Lite Co., it was disclosed by the WAA. Consolidating various manufacturing operations now being performed in a number of scattered plants, Electric Auto-Lite plans to produce headlights, tail lamps, and other automotive parts and equipment in its newly acquired 4,030,148 sq ft of floor area.

Plans have been completed for the construction of a plant for Auto-Lite Battery Corp., an Electric Auto-Lite subsidiary, at Clearwater, Calif. The new plant will cover 80,000 sq ft.

## Cuba Limits Imports of Motor Vehicle Tires & Tubes

Restrictions on the importation of tires and tubes for motor vehicles have been announced by Cuba, according to the Commerce Dept. Plans have been made to set up a quota system for tire and tube imports, although the basis upon which import licenses will be granted has not as yet been disclosed.

## Fredric Flader Developing a 7500-Hp Turbo-Propeller Engine

A 7500-hp turbine-propeller jet engine for heavy bombers and transport aircraft is reported to be under development by Fredric Flader, Inc., North Tonawanda, N. Y. Designated as the XT-33, the new power plant utilizes a multistage axial-flow compressor, and a number of cylindrical combustion chambers arranged in a circle. It also has a multi-stage turbine and an adjustable exhaust-area tail pipe. A planetary reduction gear is used for the contra-rotating propellers.

## NEW PASSENGER CAR REGISTRATIONS\*

Arranged by Makes in Descending Order According to the Ten Months' 1947 Totals

MAKE	October 1947	September 1947	October 1946	UNITS		TEN MONTHS	
				1947	1946	1947	1946
Chevrolet	52,596	43,825	41,516	825,842	209,421	20.26	15.99
Ford	50,233	44,664	41,871	432,098	249,291	18.84	19.02
Plymouth	26,354	27,841	24,212	260,832	172,599	10.05	13.18
Buick	24,509	22,280	20,049	201,563	82,341	7.76	6.29
Dodge	19,485	18,702	13,181	173,140	108,144	6.67	8.25
Pontiac	17,342	14,688	16,988	168,818	74,620	6.50	5.70
Oldsmobile	15,114	14,720	13,899	149,410	59,588	5.76	4.55
Mercury	11,830	5,599	8,646	86,366	43,338	3.33	3.31
Nash	8,175	7,710	8,636	86,301	64,499	3.32	4.92
Studebaker	9,993	8,007	7,353	83,221	42,688	3.20	3.26
Hudson	4,801	6,990	7,234	79,359	56,085	3.06	4.28
Chrysler	8,333	7,802	6,277	77,053	52,642	2.97	4.02
De Soto	6,640	6,207	4,810	59,608	44,445	2.30	3.39
Cadillac	2,913	4,938	3,131	42,659	15,061	1.84	1.15
Kaiser	6,643	5,178	133	40,173	138	1.55	.01
Packard	4,503	4,449	4,579	38,293	25,728	1.47	1.86
Frazer	6,181	5,333	119	38,204	124	1.47	.01
Willys	2,256	1,803	219	19,682	241	.76	.02
Lincoln	2,198	1,345	1,437	19,599	7,361	.75	.56
Crosley	1,476	1,487	616	13,134	1,264	.51	.10
All Others	43	87	74	681	441	.03	.03
Total	281,428	251,655	225,180	2,596,034	1,310,037	100.00	100.00

\*—Data from R. L. Polk & Co.

## Credit Buying of Automobiles Up Sharply From Year Ago

Installment buying of automobiles has increased substantially during the last year. NADA reports that a year ago 70 to 75 per cent of new car sales were for cash, whereas today in some localities installment sales now account for from two-thirds to three-fourths of the total. During October, installment purchases on automobiles increased nearly five per cent, approximately the same rate as in the preceding three months. Outstanding automobile credit at the end of October was \$1,050,000.

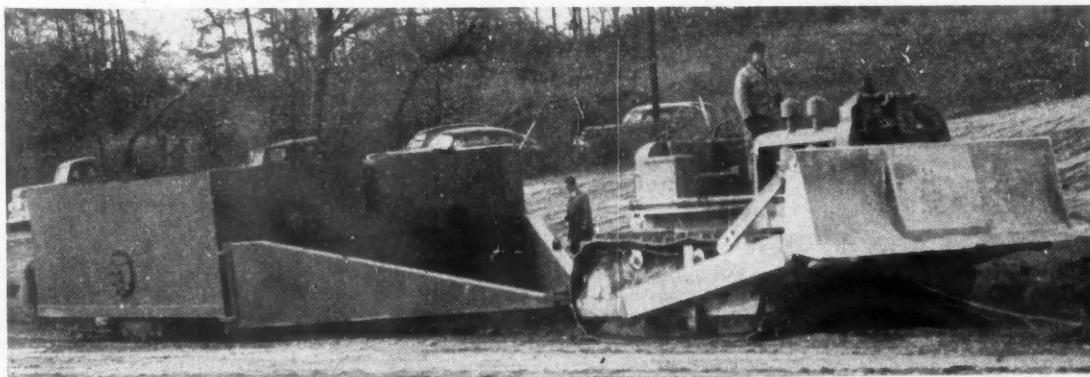
## Ford's Buffalo Plant to Up Output 25% to 40% in 1948

Employment and production in the Buffalo assembly plant of the Ford Motor Co. during 1948 will be increased 25 per cent to 40 per cent from 1947 levels, E. C. Miller, plant

manager, recently declared. He further disclosed that \$250,000 will be spent next year for retooling and improvements. The employment and production increases will be gradual, and are predicated on the availability of materials. Expansion of the second shift is planned. The plant expects to have a record production for 1947. By Dec. 31, it will have turned out more than 70,500 Ford cars and trucks. This tops the best previous recent year, 1937, by about 4000 units. Output in 1946 was 52,000 units.

## Argentine Import Restrictions To Close Car Plants There

As a result of a government ban on import permits for automobiles and automobile parts, assembly plants in Argentina are expected to be closed down for three to four months this year. The Ford plant



**SUPER COMPACTOR**  
Weighing 400,000 lb, this giant roller, reported to be the heaviest thing on wheels, designed by O. J. Porter & Co., Calif., and bought by the city of Baltimore, compacts soil to a depth of six ft. Equipped with four 30.00-33 Goodyear tires, eight ft high and about a yard wide, the roller's steel body is 20 ft long, seven ft wide and six ft deep.

# NEWS of the AUTOMOTIVE INDUSTRIES

there is expected to curtail its operations sharply early this month. GM is reported to have sufficient material on hand to operate until about the first of April on a reduced scale. The company assembling Chrysler products is in about the same position as GM. No new import permits have been granted since about the middle of June, and it is estimated that it will take at least three months after issuance of new permits before parts could be flowing into assembly lines. Quotas for 1948 automobiles are expected soon.

## Hiller Helicopter Near Production

Commercial production of the Hiller 360 three-passenger helicopter is reported to be scheduled for the early part of this year. Built by United Helicopters, Inc., which is headed by Stanley Hiller, Jr., the new 178-hp craft is currently undergoing flight tests for CAA certification. Selling price is expected to be between \$12,500 and \$20,000. An entirely new system of flight controls is claimed to give the Hiller 360

unusual stability, permitting "hands off" hovering, through the use of a universal mounting of the rotor head upon the power shaft and the introduction of a small servo rotor between the pilot and the rotor. The servo rotor, it was explained, serves to dampen oscillations of the helicopter by controlling the attitude of the main rotor. This is augmented by the rotor-head mounting which eliminates tilt from the main blades.

## Collier Award to Rodert for Thermal Ice-Prevention

The Robert J. Collier Trophy was awarded to Lewis A. Rodert, research scientist of the National Advisory Committee for Aeronautics for his pioneering research and guidance in the development and practical application of a thermal ice-prevention system for aircraft.

## Dual-Fuel Carburetor Will Be Developed

Socony-Vacuum Oil Co., which has been cooperating with General Motors at its Paulsboro, N. J., automotive research laboratory in the development of a two-fuel system of low and high octane gasolines for engines having a compression ratio up to 12 to 1, has arranged with a carburetor company to make a dual-fuel carburetor for the project. Up to the present time S-V research engineers have been doing their test work with a 1947 Cadillac equipped with two fuel systems, each including a carburetor, pump, lines and tank. So successful have been the tests, they are convinced that the dual-fuel setup will be a practical method for conserving the nation's petroleum supply. The dual-fuel carburetor will function automatically, selecting the fuel by means of manifold pressure—the low test gasoline for light loads (cruising) and the high test gasoline for heavy loads. It has been determined that cruising represents about 80 to 90 per cent of driving time, requiring only low test gasoline, which permits a big saving of high test gasoline.

## Airey Re-elected President Of Parts Manufacturers Assn.

Automotive & Aviation Parts Manufacturers, Inc., has reelected John Airey of King-Seeley Corp. as president. Malcolm P. Ferguson of Bendix Aviation Corp. has been named vice president to succeed

**THIS IS YOUR DESIGN SHEET**

IN THE TALLY COLUMN AT THE RIGHT THERE ARE LINES ON WHICH TO PUT THE PRICE OF THOSE FEATURES YOU CHOOSE IN BUILDING YOUR CAR. NOW GO AHEAD AND HOLD THE CAR YOU CAN'T DRAW ANY BETTER.

**HERE ARE THE TYPES AND STYLES OF BODIES WHICH DO YOU PREFER?**

4-DOOR SEDAN \$140	2-DOOR SEDAN \$140	CONVERTIBLE \$140	STATION WAGON \$140	UTILITY CAR \$130
4-DOOR SEDAN \$130	2-DOOR SEDAN \$120	SEDAN COUPE \$130	4-DOOR BUSINESS COUPE \$120	PUTUMATIC \$120

**THAT'S THE IDEA!**

ABOUT ONE HUNDRED AND FIFTY FIVE VARIATIONS ARE POSSIBLE.

**ENGINEERING AND ASSEMBLY COSTS ARE INCLUDED.**

**MAKE SURE YOURS ISN'T MISSING!**

**CHOOSE THE UPHOLSTERY-INTERIOR MATERIAL FROM THESE.**

**COLORS**

**NOW MUCH BRIGHT TRIM WOULD YOU LIKE?**

**ACCESSORIES**

**THIS WOULD COST \$60. (FEWER ENGINE REVOLUTIONS PER MINUTE AT HIGHER SPEEDS)**

**ELIMINATES GEAR SHIFTING**

**EAST-NORTH \$50**

**MAP STATE \$50**

**WISCONSIN \$10**

**MISSOURI \$10**

**PACIFIC COAST \$100**

**See—You've designed your car! Now total the tally column . . .**

**DESIGN IT AND PRICE IT**

**LISTING MAJOR PASSENGER CAR COMPONENTS AND THEIR PRICES, THE FOUR-COLOR ILLUSTRATED QUESTIONNAIRE SHOWN ABOVE HAS BEEN DISTRIBUTED THROUGHOUT THE COUNTRY TO THOUSANDS OF AUTOMOBILE OWNERS BY THE FORD MOTOR CO. AUTOMOBILE SIZE, BODY STYLE, ENGINE, INTERIOR DECORATION, CHROME TRIM, ACCESSORIES, AND EXTRAS, ALL PRICE TAGGED, GIVE THE PUBLIC A CHANCE TO DESIGN AND THEN PRICE A NEW AUTOMOBILE.**

# NEWS of the AUTOMOTIVE INDUSTRIES



Authenticated News

## CZECH CONVEYANCE

Representing another product of the Czechoslovakian motor vehicle industry, this new Skoda bus was recently displayed at the 28th International Automobile Exhibition or "Autosalon," the first to be held since the war, at Prague.

George W. Kennedy of Kelsey-Hayes Wheel Co. New secretary-treasurer is Walter F. Rockwell of Timken-Detroit Axle Co. who succeeds J. L. Myers of Cleveland Graphite Bronze Co. New directors, elected for three year terms are: Ralph E. Carpenter, Dana Corp.; William C. Dunn, Ohio Crankshaft Co.; Malcolm P. Ferguson, Bendix Aviation Corp.; Lloyd A. Johnson, National Motor Bearing Co., Inc., and W. D. Robinson, Briggs Mfg. Co. Holdover directors: K. J. Ammerman, Borg-Warner Corp.; Wendell W. Anderson, Bundy Tubing Co.; F. L. Burke, General Motors Corp.; C. C. Carlton, Motor Wheel Corp.; R. H. Daisley, Eaton Mfg. Co.; J. D. Eby, Wagner Elec. Corp.; F. C. Greenhill, Acklin Stamping Co., and J. Y. Scott, Van Norman Co.

## Labor

### UAW-CIO Moves to Purge Non-Compliance Rebels

Following the anti-Communist purge of the UAW-CIO at the annual convention in November, the union has been moving energetically to clean out officials who refuse to sign the anti-Communist affidavit required under the Taft-Hartley Law before the union can utilize the services of NLRB. The members of Ford Local 600, largest in the country, have been asked to vote on whether

five officers who refused to sign the statements should be removed from office. The referendum was called on recommendation of the local's general council. The action is considered a severe blow to the Communists, who have had a larger measure of success in the Ford local than in any other in the industry. The membership of a smaller local in Detroit recently voted its recording secretary out of office when he refused to sign the affidavit.

### K-F Distributes Bonus of \$748,665 to 10,318 Employees

Kaiser-Frazer Corp. has distributed \$650,889 to 9106 employees eligible to share in the company's security trust fund under its agreement with the UAW-CIO. In addition, the company divided an equitable matching fund of \$97,776 to 1212 secretaries, executives and confidential personnel not eligible to share in the security trust fund. Average payment was \$72.16, with individual checks ranging as high as \$92.77. The trust fund is part of the company's agreement with the union and involves a contribution of \$5 for each car shipped during the trust fund year. The accumulated total is distributed among employees who have been on the payroll 90 regular shifts prior to the termination date of the fund year, and who have been on the job 90 per cent of the shifts they have been scheduled to work.

### Detroit Mechanics Strike Ends But Dealers Expect New Drive

Detroit automobile dealers at year-end were uneasy victors in their battle with Local 415 of the UAW-CIO. The strike of mechanics, which had started in August, had been pretty well broken, with practically all men back on the job at the 77 dealerships involved. Ray Dooe, leader of the violence-ridden walkout had resigned under pressure. A few token picket lines still were up, but nothing of any consequence was happening. However, the UAW installed Joseph McCusker as administrator over the affairs of the local with orders to renew efforts for a new contract. Other organizing efforts in various parts of the country will hinge to some extent on how the Detroit local comes out. Competition in the form of the Independent Garage Workers Assn. has made some gains, particularly in one Chevrolet agency where it won 59 out of 66 votes. The union claims that it has affidavits from a large majority of the mechanics involved showing that they prefer Local 415 as their bargaining agent. However, dealers may insist that a bargaining election be held before they agree to negotiate. Whatever the outcome, it now seems certain that although there may be walkouts, the union has learned that goon squads and violence serve to defeat their own ends.

## Metals

### Copper

An improving brass mill demand together with high wire mill demand are the principal factors in the currently strong demand for January copper. Replenishment of inventories which were allowed to drop during the summer, however, is believed to be the primary cause of the current volume of orders.

### Antimony

It is currently rumored that the Bolivian antimony supply for the first half of the year has been bought by the United Kingdom. Because Bolivia can make good use of sterling exchange, ordinarily a large amount of Bolivian antimony does go to Britain; however, the market is inclined to doubt the report's authenticity.

(Turn to page 84, please)

# 1948

## What the New Year Holds

### The Automobile Industry Looks Ahead

By Leonard Westrate

*This Special Series of Five Articles, Pages 24 to 33, Presents a Comprehensive Picture of the Trends in the Automotive Industries for the Next 12 Months. Beginning on This Page, Leonard Westrate Discusses the Prospects for Increasing Passenger Car Production and the Outlook for Trucks, Buses, and Replacement Parts. Plant Expansion and Modernization Are Outlined on Page 28. How Some Companies Are Endeavor-*

PRODUCTION prospects in the automobile industry for 1948 hinge entirely on the supply of sheet steel available. The outlook is not too favorable for the first half of the year in that respect, but for the year as a whole the general belief is that U. S. motor vehicle production can be increased by about 10 per cent over 1947, which would make the forecast about 5.25 million units. Practically all the increase will be in passenger car production, which is expected to reach 4,000,000 units in 1948. There is no doubt that all cars and trucks built can be sold, although in some of the higher priced lines of cars and in heavy duty trucks, the market is not so strong as it was and some selling may be necessary before the year is out. In popular priced cars, however, and in panel truck lines, the demand appears insatiable. Backlogs of orders in these categories are, if anything, bigger than they were at the outset of 1946.

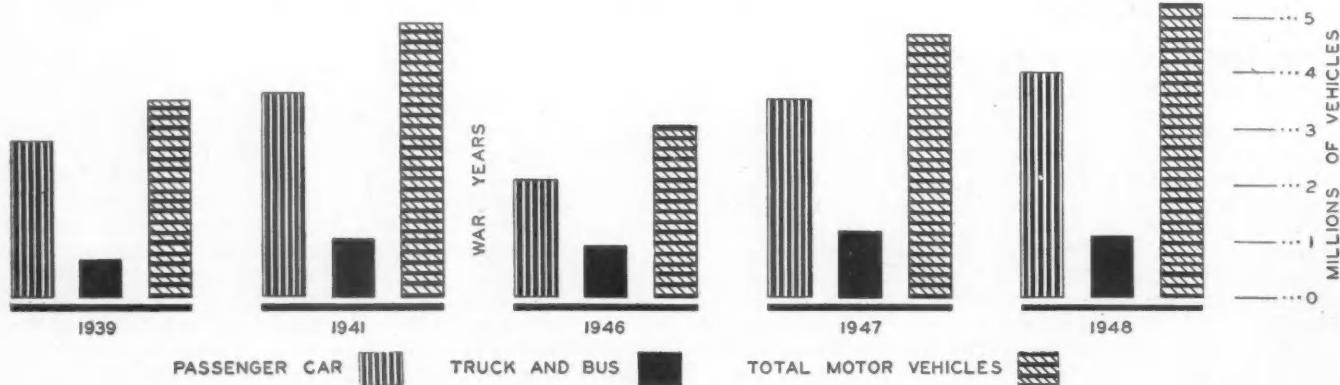
In view of the tremendous importance of the steel supply on how many vehicles will be produced this year, the steel scrap situation merits some discussion. Normally around 50 per cent of the steel comes from pig

iron and 50 per cent from scrap. About half the steel scrap is generated in the steel industry and the balance purchased. To operate at capacity, the steel industry requires about 26 million tons of purchased scrap a year in addition to its own. With the foundries requiring an additional 5 million tons of purchased scrap, the total required is 31 million tons. Yet with the current demand at a record two million tons a month plus, the visible supply is barely enough to fill a single month's needs at a season when inventories should be high because of the slowed collections during the winter months.

According to industry sources, scrap is short principally because the national reservoir of scrap is depleted. That is why present record prices do not bring out an increased supply. Factors responsible for depletion of the national scrap backlog are:

1. The full output operation of steel mills during the past seven years has drained the national scrap reserve faster than it was replaced. There now is real doubt that the prewar level of the national reservoir will be regained during the next 25 years.

PREWAR AND POSTWAR MOTOR VEHICLE OUTPUT AT U. S. PLANTS



# 1948

## for the Automotive Industries

*ing to Raise Passenger Car Output by Using Aluminum Wherever Feasible Is Related by James R. Custer on Page 29. H. E. Everett Tells About the Tremendous Demand for Tractors on Page 30 and What the Tractor Industry Is Doing to Meet It. Robert McLaren Foresees a 20 Per Cent Higher Dollar Volume Output by the Aircraft Manufacturers in 1948, Made Possible by Military Orders. His Article Starts on Page 32.*

2. Between 1930 and 1940, about 20 million tons of scrap was exported to other countries.

3. During the war, an estimated 140 million tons of steel in the form of military equipment and supplies were shipped abroad, most of which will never return to this country in the form of scrap.

The last two items alone account for about 160 million tons of lost scrap, or enough to carry the steel industry at capacity level for six years.

Increased production of pig iron to replace scrap for conversion into steel has been suggested, but is not an easy answer to the problem. Since steel made with an increased proportion of pig iron in the mix requires more time in the process, a large increase in steel-making facilities would have to be made if the total output of steel were not to diminish. Also, an expansion in ore mining, transportation, and reduction would have to be made, all of which are now crowded to capacity. More coking coal, already in short supply would have to be produced. It is estimated that replacing one half the normal amount of purchased scrap with pig iron would require about 20 per cent more ore boats, blast furnaces, and coking coal, and about twice as many Bessemer converters as now are used. Such a program would entail a tremendous capital investment and several years time to complete. It also would materially hasten the rate of exhaustion of high grade ore. Consequently, it is apparent that the question is not one of increasing steel-making facilities so much as it is one of obtaining adequate scrap and coking coal to maintain present production and to operate expanded facilities when they are ready.

All things considered, 1947 turned out to be a very good year for the automobile industry. In spite of all the troubles and shortages during the year, a very good case can be made out for the premise that it was the best performance year in its history when all considerations are taken into account.

### AUTOMOBILE INDUSTRY COMPARATIVE DATA

	1941	1946	1947 Estimated	1947 Above or Below 1941	1948 1946
Motor Vehicle Factory Sales from U. S. Plants					
Passenger Cars.....	3,780,000	2,148,000	3,522,000	-7%	+65%
Trucks and Buses.....	1,061,000	941,000	1,242,000	+17%	+32%
Total Motor Vehicles..	4,841,000	3,090,000	4,764,000	-2%	+54%
Total Registrations As of December 31st					
Passenger Cars.....	29,240,417	27,834,543	30,650,265	+5%	+10%
Buses.....	52,337	109,170	116,739	+123%	+7%
Trucks.....	4,859,653	5,749,843	6,593,408	+35%	+15%
Total Motor Vehicles..	34,152,407	33,693,356	37,360,412	+9%	+11%
Special Motor Vehicle Taxes (Dollars)					
State Registration Receipts.....	511 mil.	551 mil.	602 mil.	+18%	+9%
State Gas Tax.....	951 mil.	1,065 bil.	1,178 bil.	+24%	+11%
Federal Excise Tax.....	573 mil.	796 mil.	1,003 bil.	+75%	+26%
Local Taxes and Tolls....	112 mil.	95 mil.	95 mil.	....	0
Total Taxes.....	2.147 bil.	2.507 bil.	2.878 bil.	+34%	+15%
Replacement Parts Wholesale Value.....	\$718,000,000	\$1,753 bil.	\$2.250 bil.	+213%	+28%
Production Workers in the Automobile and Equipment Industry					
Number of production workers.....	570,000	661,000	785,000	+38%	+19%
Annual Payroll.....	\$1,346 bil.	\$1,713 bil.	\$2.3 bil.	+71%	+34%
Total Workers, including Salaried.....	654,000	819,000	960,000	+47%	+17%
Age of Passenger Cars in Use					
Average.....	5.5 Years	9.0	9.0	+64%	0
Vehicle Miles Traveled..	333,400 bil.	340,655 bil.	370 bil.	+11%	+9%

The following estimates of car and truck production are based on 11 months figures and the best available projection for December. They show that while the industry did not come up to the levels of either 1929 or 1941, it may have eclipsed 1937 by a narrow margin. Output last year, according to best estimates available, was very close to 5 million cars and trucks in the United States and Canada. U. S. production is calculated at between 4.725 and 4.770 million. In 1929, the previous all-time high, it was 5.358 million units for U. S. plants. However, that record was made on the basis of six days a week, with three shifts in manufacturing operations and two shifts on assembly, a limited number of two-shift operations in manufacturing, and three shifts were used little if at all, except in companies with steel and foundry operations. Similarly, practically all automotive manufacturing and assembly was on a five-day week of 40 hours. It certainly is safe to say that if materials had been available in adequate supply, the industry could have far outstripped the 1929 record.

Another good index of manufacturing performance is indicated by the tonnage of steel used the two years being compared. In 1929, the industry used a total

# 1948

## The Automobile Industry

### EARNINGS OF AUTOMOBILE INDUSTRY EMPLOYES UP 59 PER CENT IN 1947 OVER 1940

	Average Hourly Earnings	Average Weekly Earnings
First 8 Months 1940.....	\$ .945	\$34.83
First 8 Months 1947.....	1.465*	55.49
% Increase—1947 over 1940.....	54.0%	59.3%

\* Includes allowance for paid holiday in June, July and August, 1947.

Source: Bureau of Labor Statistics.

### AUTOMOBILE INDUSTRY EMPLOYEES AND THEIR EARNINGS IN 1947

1947	Number Employees (000)	Total Weekly Payrolls (000)	Average Gross Hourly Earnings	Average Weekly Hours	Average Weekly Earnings
January.....	755	\$40,280	\$1.390	38.9	\$54.13
February.....	791	42,291	1.399	38.8	54.29
March.....	798	43,695	1.396	39.7	55.45
April.....	807	43,055	1.406	38.5	54.14
May.....	751	41,250	1.463	38.3	55.96
June.....	789	44,761	1.485	38.7	57.48
July.....	785	43,733	1.498	37.7	56.44
August.....	770	42,842	1.501	37.3	56.07
September.....	797	NA	NA	NA	NA
October.....	812	NA	NA	NA	NA

NA—Not Available.

Note.—Payroll statistics do not reflect payment for holidays not worked or payment in lieu of vacation. Wage settlement of Ford Motor Company made in September is not reflected in payroll statistics, although it was retroactive to May 1947.

Source:—U. S. Bureau of Labor Statistics.

of 7.2 million tons. In 1947, it chewed up 9.1 million tons, a new all-time record. Part of the increase is accounted for in the larger, heavier cars being built today, but an important additional factor is the phenomenal production of replacement parts. No figures are available for 1929, so a statistical comparison cannot be made on parts production for the two years. However, with registrations numbering only 26.5 million in 1929, with the average age of cars considerably under what it is today, and with new cars readily available, the repair parts business was certainly only a fraction of what it was in 1947.

The volume of replacement parts manufacture soared to new heights in 1947 to an estimated dollar value of \$2.250 billion. C. E. Wilson, president of General Motors, has estimated that the materials and services required for repairing old cars would be equivalent to between 750,000 and a million new cars. When that factor is taken into consideration, it is not unreasonable to say that in total production in terms of transportation, the industry in 1947 made an outstanding performance record at least equal to that of 1929, and probably better.

#### Bus Output Almost Double

Although total automobile production in number of units was not a record last year, the number of trucks built was far ahead of any year in history. Buses also hit a new high with 19,000 built, 90 per cent above the previous high year, 1946. Some division of opinion

exists among bus manufacturers about the outlook for 1948. Some think that business this year will be about the same as 1947, but others believe that it may drop off somewhat. The backlog of orders for buses has not yet been met and there is a need for a large number of units, but the principal question about how many can be sold centers around the financial position of the operators. Faced with a shrinking net profits owing to low fares which have not kept up with increased costs, some operators may defer purchase of new equipment. On the other hand, the number of riders being carried is far above prewar level, and the public responsibility to provide transportation will lend support to the bus market.

#### Record Truck Production

Production of trucks is estimated at about 1.31 million for the U. S. and Canada, which is the greatest year on record, exceeding even 1941 when a total of 1.2 million civilian and military trucks were built in the two countries. The comparison between truck production in the U.S. in 1941 and in 1947 however, shows a much greater gain. In 1941, 823,205 civilian trucks and 218,880 military vehicles were built for a total of 1.04 million. At the end of November last year, U.S. manufacturers had turned out 1.13 million units and by the end of the year had increased that to an estimated 1.22 million. Canadian production is estimated at about 92,000 for the year, for a combined total of about 1.3 million. In the opinion of most manufacturers, the 1947 record is likely to stand for quite a long time as the best truck production year. The outlook is for between 1.1 and 1.2 million units to be built in 1948, and for new truck registrations eventually to level off to about 850,000 a year, compared with 640,000 in 1941. Because of the sheet steel shortage, the biggest backlog is in panel delivery trucks which require a large amount of material, and it is expected that any large volume of panel production will have to wait until the sheet steel shortage is over.

One factor to remember in connection with the steel shortage is that both cars and trucks being built this year require a lot more sheet steel than did previous models. New automobile styles already announced are considerably wider and employ extensive use of massive panels, wider hoods, and more complete envelopment of wheels. Total overall weight of the Packard, Hudson, and forthcoming Cadillac is up 150 to 250 lb and others undoubtedly also will weigh more, with the possible exception of Ford, Chevrolet, and Plymouth. Trucks also have much wider cabs and more massive fender, hood, and front-end treatment. Consequently, the total increase in the supply of steel this year may not be entirely reflected in an increased number of units built.

With the exception of steel, and the possible exception of pig iron, material shortages which plagued the industry during the last months of 1946 and early 1947

# Looks Ahead

# 1948

have been pretty well cleared up. Copper, lead, and textiles, which had caused a lot of difficulty came into fairly good supply during the year and are no longer any cause of worry. Another possible source of trouble is glass. There has been a continuing pinch in the supply of soda ash since the end of the war. With new models requiring more glass than previous ones, any great expansion of production might result in a shortage of glass.

## Replacement Parts Boom

As mentioned earlier, the replacement parts business boomed to a new high in 1947. There is no accurate measure of physical volume available, but wholesale dollar value figures for the year reveal the astounding total of \$2.25 billion, an increase of 213 per cent over the 1941 level and 28 per cent higher than the 1946 total. Here again there is a belief that this figure will represent a high that will stand for some time. The outlook is for a slight tapering off in total volume this year unless there is an unexpected spurt in prices, in which case the dollar value would be up, but physical volume still would be under the 1947 level. The role the replacement parts business played in total transportation in 1947 is hard to say accurately, but there is no doubt that countless more cars are operating today than would have been if the material used for repair parts had gone into manufacture of new cars. As one spokesman put it, "The steel required to make one new car can keep quite a few old ones operating if put into replacement parts."

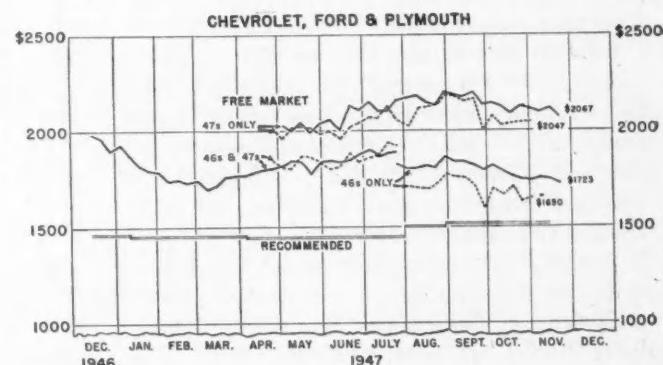
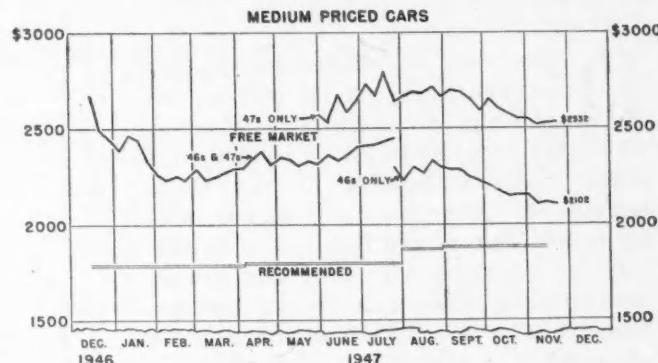
The service field in 1947 hit a new high also. It is estimated that retail sales of replacement parts amounted to \$3.8 billion and repair labor another \$2.9 billion for a total of \$6.7 billion. This figure represents a greater total than the combined sales of Sears Roebuck, Montgomery Ward, General Electric, and U. S. Steel, according to M. E. St. Aubin, director of the service section for General Motors, who provided the estimates. He believes that service business will fall off this year and eventually stabilize at a level higher than prewar because of the greater number of cars and trucks in operation. Also, owners have learned the habit of repairing their cars. However, the percentage of late model cars is constantly increasing and with production going well, more and more old car owners are doing just as little patching up as possible to keep the car rolling until they can get delivery of a new one.

## New Automobile Builders

Nineteen forty-seven witnessed entry of several new contenders in the passenger car field either actually or announced. Tucker Corporation completed its organization, floated a stock issue, and prepared to get ready for production. John J. Tjaarda, Detroit automotive designer, announced plans for a new car to be

## FREE MARKET PRICES FOR 1946 & 1947 MODELS COMPARED WITH MANUFACTURERS RECOMMENDED RETAIL PRICES

Station wagons and convertibles are excluded  
Interdecile averages for each make are combined with weights proportional to production



### FREE MARKET PRICES

Solid Line (—)

Average of prices in classified ads of Sunday newspapers from ten large cities.

Dotted Line (-----)

Average of auction prices as reported from 5 to 8 locations.

### MANUFACTURERS RECOMMENDED RETAIL PRICE

Hollow Line (—)

Recommended advertised delivered price + 10% for additional accessories + \$50 freight.

built by North American Motors, Inc., which intends to build the car, to be called the "Cortez," at Grand Prairie, Texas. Both the Tucker and the Cortez are conventional sized automobiles. Keller Motors, Inc., has exhibited its car, successor to the Bobbi-Kar, a small vehicle powered with a four-cylinder engine, which will be built at Huntsville, Ala. Other small-car entries are the Davis Motorcar Corp. at Van Nuys, Calif., and the Playboy Motor Car Co. at Buffalo, which have displayed models of their cars. Both companies are planning to get into production this year. In addition, there have been several more small automobile ventures announced, a few of which have actu-

(Turn to page 80, please)

# 1948

## Plant Expansion and Modernization

By Leonard Westrate

DURING 1947 the automobile industry got well along on its postwar expansion and modernization program which has been estimated at more than a billion dollars. Because of the intermingling of tooling costs with expenditures for new machinery and facilities, it is difficult to tell exactly how much has already been spent on new plants alone. However, from announced completions and projects underway it is evident the program industry wide will continue to move along at a good pace in 1948.

General Motors last year opened its new Chevrolet-Fisher assembly plant at Flint and had a second similar unit at Van Nuys nearly ready to go. Buick-Olds-Pontiac assembly units at Kansas City, Kan.; Wilmington, Del., and Doraville, Ga., have come into operation and another at Framingham, Mass., is nearing completion and is scheduled to start operating in March. A Fisher-Ternstedt unit at Columbus, also started operating during the year. In addition various divisions completed expansion of facilities, notably Buick, Cadillac, and Pontiac. Buick late in the year finished its program comprising 17 new buildings and more than 2 million sq ft of new floor space. Cadillac finished its modern foundry expansion and modernization program, and Pontiac modernized and enlarged its production facilities, notably in engines and axles production, and installed a new large plating operation. GM does not give out dollar value figures on its building program, but it is known to run into hundreds of millions. A new research center is planned for the future, but the time is indefinite. An interesting development about the new plant program at GM is that while many new plants are coming in, their capacity cannot be fully utilized because of the shortage of materials, principally steel.

Ford also has made good progress on a continuing program of modernization and expansion. The first of four postwar assembly plants went into operation at Hapeville, Ga., near Atlanta, in December of last year for assembly of Ford cars and trucks. Three other plants—at St. Louis, Los Angeles, and Metuchen, N. J.—will be completed this year for assembly of Lincoln and Mercury cars.

Actual construction of the new Lincoln-Mercury assembly plant in Los Angeles has been completed and

### 1947 MOTOR VEHICLE FACTORY SALES FROM PLANTS IN U. S.

(Number of Vehicles)

Month	Passenger Cars	Motor Trucks	Motor Coaches	Total
January.....	246,605	99,818	1,273	347,696
February.....	267,015	105,042	1,303	373,360
March.....	301,625	118,234	1,421	421,180
April.....	314,765	106,984	1,650	423,399
May.....	284,357	96,430	1,853	382,640
June.....	307,124	91,620	1,628	400,372
July.....	279,631	97,755	1,806	379,192
August.....	261,158	86,486	1,765	349,409
September.....	307,942	110,720	1,609	420,270
October.....	315,869	118,365	1,667	436,001
November.....	306,000	90,500	1,800	398,100
December*.....	330,000	101,000	1,500	432,500
Total, 1947.....	3,522,091	1,222,954	19,074	4,764,119

\*—Estimated.

rapid progress is being made in setting up the internal installations, according to Aubrey R. Davis, plant manager. Finishing touches are being put on the conveyors throughout the plant and final work is also being pushed on spray booths and paint ovens. Jigs and fixtures used in body assembly are in place and being readied for use. The railroad spur entering the plant has been in service for some months, making it possible to unload supplies, furniture and equipment directly into the plant. At full capacity the plant will employ 1400 persons and will assemble 200 Lincoln and Mercury automobiles daily. The assembly line will be approximately 640 ft long.

Assembly of automobiles will commence as soon as Lincoln-Mercury headquarters at Detroit give the signal for production of new models.

In addition, the Ford Highland Park plant was modernized last year at a cost of a half million dollars, and extensive expansion and modernization programs have been completed or are in progress at the Rouge, chiefly in the foundry and steel mill, at an estimated cost of about \$35 million. Ford also has spent \$500,000 to lengthen the assembly line at the Memphis plant, and has tripled the size of the Ypsilanti, Mich., operation. Six parts depots throughout the country account for another half million dollars. Ford also has purchased

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# Aluminum Stretches Steel Supply for Cars

# 1948

**Many Aluminum Parts in 1948 Cars and More to Come. Some Companies Adopting This Program to Boost Production by Releasing Steel for Other Uses.**

By James R. Custer

**A**LUMINUM is attempting a comeback on a large scale in the automobile industry and strangely enough with the help of steel or more specifically—the lack of steel and its higher prices. This challenge is not new. In the early days aluminum was a strong competitor of steel for certain applications, particularly sheet metal parts such as body panels, mud guards, hoods and mufflers. The first American-made aluminum body was introduced in 1902 by a leading body builder. But with the advancement in making steel in large tonnages at low cost, the importance of aluminum in passenger cars became less and less.

Years later when research produced better aluminum alloys and reduced their cost, the light metal entered the picture again and some companies began equipping their engines with pistons and cylinder heads made of aluminum. In 1937 the secondary aluminum market became unstable and the price of aluminum halted its increasing use in passenger cars. The requirements for World War II almost entirely

eliminated it by 1942, but with the resumption of passenger car production in late 1945, aluminum engine pistons, cylinder heads, timing gears and brake pistons made their appearance again.

Months ago the outlook for steel in 1948 indicated that the supply would continue short for capacity production and engineering departments were alerted with projects for replacing steel wherever possible without sacrificing quality or strength. Progress has been made to the extent that 1948 cars have many more aluminum parts than their prewar predecessors and as a result 1948 production should be higher by many thousand cars. Weight saving also will be welcome since cars have been getting heavier due to wider bodies more expansive treatment of fenders, hoods and other sheet metal parts, larger bumpers and more ornate grilles. It is estimated that the entire aluminum industry in 1948 will sell from 120 million to 125 million lb of aluminum alloys to the automobile industry for use in passenger cars, trucks, buses, trailers, engines, parts and accessories.

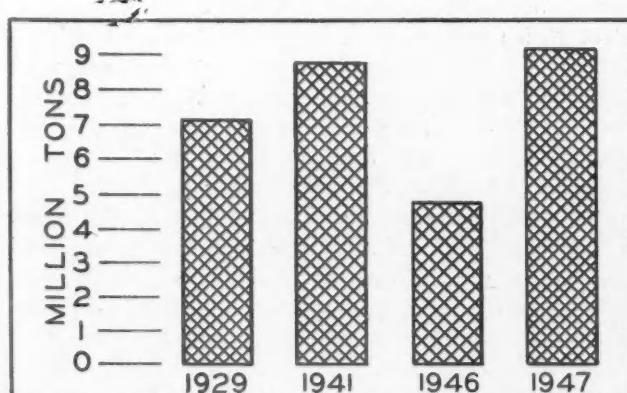
## Ford Investigates Many Parts

Ford is perhaps the biggest user of aluminum with current Ford and Mercury cars containing 13 aluminum parts that were not present in the first postwar models. In addition Ford engineers have approved 43 other parts of aluminum which are listed as "probable" for subsequent models. Among items regarded as "probables," after further testing, are aluminum seat parts such as tracks, window moldings, door scuff plates, voltage regulator covers, air intake pipes and ducts. Besides the 43 parts, many other parts are being tested for future use and are now identified as "possibles."

Ford officials say that this extensive use of aluminum would release enough steel to increase the company's output 100,000 cars a year. Aluminum parts now in production include headlamp housings, running boards, gravel deflectors, air deflectors, and numerous braces.

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STEEL CONSUMED BY AUTOMOBILE INDUSTRY\*



\*—For trucks, buses, cars and replacement parts.



Today's mechanized logging industry uses scores of specialized tools and machines. This photo shows a tractor and crane skidding fir logs from the woods to a truck loading. (Authenticated News photo)

## '48 Another Big Year for the Tractor Industry

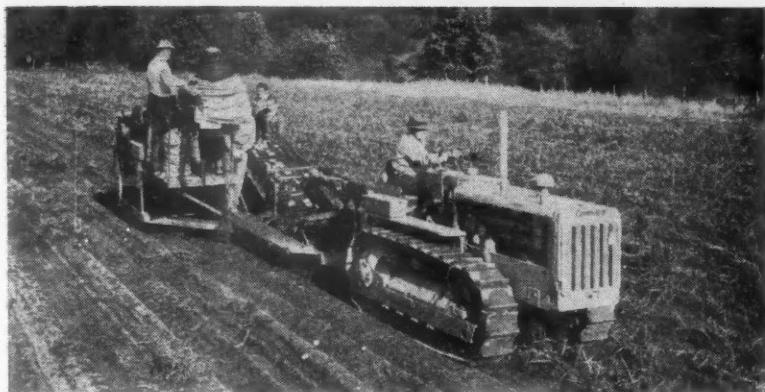
By H. E. Everett,  
Vice Pres. and Editor,  
*Implement & Tractor*

THE tractor industry is facing an all-time record demand for its products for 1948. Were materials and manpower available in adequate supply, its presently expanded facilities would readily permit a \$250 million increase over its approximate \$1.1 billion output of 1947. But unless it can make these hurdles, production is likely to be but little higher than in 1947, and the Marshall Plan requirements may reduce the supply for the normal domestic and export markets.

Despite the fact that 1947 production has been 25 per cent greater than that of the previous year, the industry has ended its selling season with virtually no inventory in the hands of manufacturers or dealers together with a substantial backlog of unfilled orders. The extra service demanded of tractors during the war years is now presenting an abnormal replacement

requirement. In addition, Secretary Anderson of the Department of Agriculture has asked the farmers to plant nine million additional acres of basic crops for 1948, which is about 25 per cent greater than the normal planted acreages of either New York or Pennsylvania. The domestic demand, if food production goals are to be attained, could readily absorb the industry's entire 1948 production.

Steel however has been restricting production during the last two years, and little additional tonnage is in sight for 1948. The present greatest shortage is in sheets, which are used in the manufacture of tractors, combines, corn pickers, automatic pick-up hay balers, forage harvesters and other basic tractor equipment. Manufacturers have been forced to resort to many expedients, such as accepting unusable tonnage and arranging with mills to have it re-rolled to their



*Illustrative of how mass production of crops has been made possible by farm mechanization, this machine digs and sacks potatoes at the rate of 1226 sacks per day.*  
*(Authenticated News photo)*



*Speedy construction of highways is common today. Here a crawler tractor, claimed to be the largest and most powerful of its kind in the world, is pulling a scraper loaded with 20 cu yd of dirt at a road building operation in the Kentucky mountains. Its maximum drawbar pull is 30,000 lb.*

specifications, or going into the gray markets to fill out inventories to keep production lines in operation.

With steel continuing as the major bottleneck, manufacturers believe their best chances for 1948 will lie in a free and open market. Most of them feel that the steel suppliers with whom they have been dealing for a long time will give them all possible breaks; may even institute some system of voluntary allocation. Governmental allocation, while it might stimulate deliveries temporarily, would impose objectionable controls and eventually would result in a series of priorities to other industries and in the long run produce less tonnage. They also believe that with governmental control a larger percentage of steel would gravitate to gray markets.

#### Labor Supply Critical

The labor supply, while easing somewhat as 1947 is ending, continues critical. Nearly every important plant in the industry could use an additional 200 to 600 men, both skilled and unskilled labor. Manpower shortages are even greater in communities in which new plants have been opened during recent months and in which housing is inadequate to permit importations from other cities. Few plants have been able to operate more than a single shift during 1947.

Another industry headache as the new year approaches is the Marshall Plan which will superimpose

extra production responsibility upon the industry. Unless output can be increased more than now seems probable, the tractor and farm equipment requirements for the 16 nations involved will have to be subtracted from the domestic supply or exports now going to non-European markets, such as Australia and Latin-America, which are most important from the standpoint of world food production than Western Europe.

Original tractor and farm equipment specifications under the Marshall Plan totaled about \$370 million for 1948 and \$1.1 billion for the following three years, an average of about one-third the industry's present annual production. Later screening and planning has reduced present consideration to about \$125 million annually, which is about the annual equivalent of present total exports.

One objective of the Marshall Plan, the restoration of German and British tractor and farm equipment plants, is favored by American manufacturers notwithstanding that these were formidable prewar competitors in world markets. Full prewar production by these foreign industries would ease the present pressure upon American manufacturers, and the availability of parts would bring back into service many machines now idle in Europe and other parts of the world.

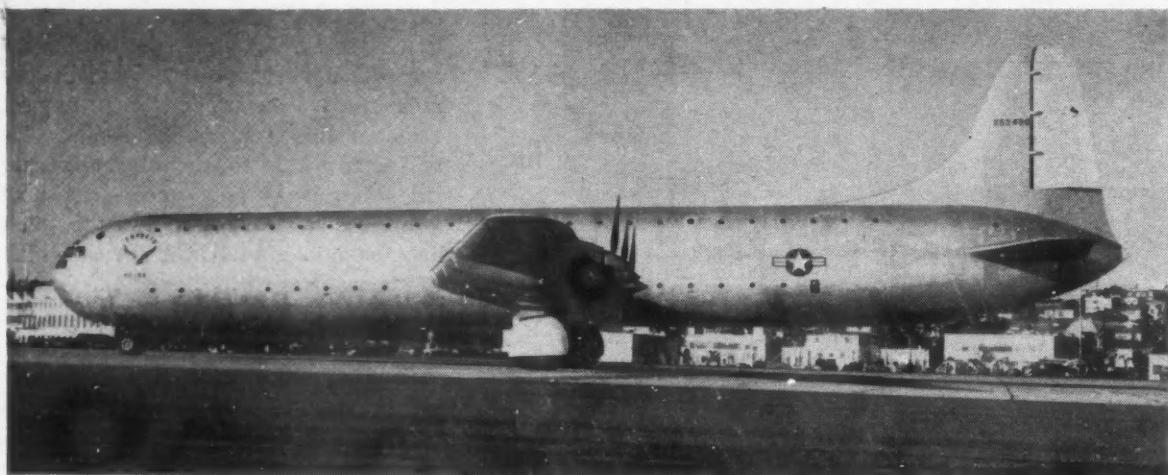
#### Plant Expansion Continues

Continuing expansion of the industry's production facilities is planned for 1948, including completion of the 1947 program involving expenditures exceeding \$100 million, some of which has been delayed by material and labor shortages and other construction difficulties. Deere recently acquired two Iowa plants from the War Assets Administration, which are now being retooled for farm equipment production. Operations have been under way for some time in its new tractor plant in Dubuque. These with the plants at Waterloo and Ottumwa will make the company the largest employer of labor in that state.

Allis-Chalmers has acquired a plant at Gadsden, Ala., and with additional construction now in progress hopes to start production on its new cotton picker during the coming year. Dearborn Motors, distributor of the new Ford tractor, has purchased the Wood Bros' combine and corn picker plant at Des Moines, which it took over Jan. 1.

The industry is looking forward to fairly satisfactory relations with labor during 1948. Work stoppages in 1947 were comparatively few in sharp contrast to 1946, during every day of which one or more plants were strike-bound. Two of the industry's

*(Turn to page 70, please)*



The Convair XC-99, Air Force 133-ton transport and world's largest land plane, completely overshadows most of the buildings on the hillside at San Diego's Lindbergh Field. It is 182½ ft long, its tail towers 57½ ft and main landing wheels are 110 in. in diameter. In the wings are tanks for 21,116 gal of gasoline and 1200 gal of engine oil. The fuselage and wing, excluding engines, tires and equipment, contain about 75,000 lb of aluminum and magnesium alloys, 18,000 lb of steel alloys, and 2000 lb of plastics and glass. The XC-99 can haul 400 fully equipped troops or 100,000 lb of cargo.

## Aircraft Industry Outlook Bright for 1948

By Robert McLaren

THE aircraft manufacturing industry enters 1948 with firm prospects for a substantial increase in its income. While the production trend indicates a lower unit output during the year, the dollar volume should be up about 20 per cent over 1947. This income will continue to be heavily military with an even greater proportion of the total being made up of Army and Navy procurement.

Profits appear certain in the majority of companies with a general tone of mounting financial stabilization throughout the industry. Employment probably will not gain substantially during the year but average industry takehome pay will continue to rise. Isolated failures are certain, particularly in the personal aircraft manufacturing field with many others converting to non-aviation products.

Many problems not its own will continue to plague the manufacturing industry during 1948 but these are expected to diminish with the completion of the two air policy studies now nearing a close. Much of the industries' current prospects hinge on prompt execution of these policy findings into enabling legislation and there are manifold indications that this

### AIRCRAFT MANUFACTURING INDUSTRY INCOME—1947

From Sales of Products Delivered

(estimated)

Complete Aircraft and Parts .....	\$ 675,000,000
Other Aircraft Products .....	60,000,000
Complete Aircraft Engines and Parts .....	285,000,000
Other Aircraft Engine Products .....	4,500,000
Total .....	\$1,024,500,000

will be brought to fruition with the beginning of the 1949 fiscal year July 1, 1948.

### Military Procurement

It is on a continued expansion of Air Force and Bureau of Aeronautics procurement that the industry's optimism for 1948 is based. There are ample indications that with the new fiscal year military procurement will be approximately doubled with resultant

## AIRCRAFT AND ENGINE PLANT EMPLOYMENT—1947

Month	Aircraft	Engine	Total
January	163,521	33,348	196,869
February	161,612	34,642	196,254
March	159,824	36,436	196,260
April	161,130	35,739	196,869
May	152,318	34,289	186,007
June	145,251	33,980	179,231
July	144,280	33,140	177,420
August	144,383	33,048	177,431
September	143,302	32,139	175,441
January 1, 1948 (estimated)	143,000	32,000	175,000

strengthening of the industry's financial and production strength. The industry is in a particularly strategic position for new military orders due to the availability of many prototype aircraft of superior performance already found acceptable to the services, production contracts on which are merely awaiting increased procurement funds. Included among these are:

Aire Force	Navy
North American XP-86	Gruman F9F
Boeing XB-47	McDonnell F2D
Northrop YB-49	Vought F6U
Martin XB-48	North American FJ
Convair XB-46	Gruman JR2F
Convair XC-99	Lockheed R60

All of these aircraft have received their preliminary flight tests, some have passed their Phase II military tests and several are in limited service test production. These aircraft are "ready to go" after the new funds become available in July.

Already in quantity production but suitable for continued or expanded production are:

Air Force	Navy
Lockheed P-80B	Gruman F8F
Republic P-84	Vought F4U-5
North American B-45	Martin AM-1
Boeing B-50	Douglas AD-1
Boeing C-97	McDonnell FD-1
Northrop B-35	Martin PB M
Convair B-36	Lockheed P2V

These aircraft are postwar types under development during the last months of the war and are interim types until the newer jet craft are proved and placed in production. They will constitute our "Air Force in being," recommended strongly by the services and the industry, for the next two years.

The lower unit volume anticipated for the year reflects the predominance of heavy bombers and transport types. These craft, however, will comprise an airframe weight and a dollar volume as large or slightly larger than the previous year.

In prospect for first test flights during the year are a number of radical new types expected to fly faster than

the speed of sound: Lockheed XP-90, Republic XP-91, Convair XP-92 and Lockheed XP-93. Quantity production of one or more of these craft is assured with the Air Force's aim to possess supersonic fighter groups by the end of 1950.

While the Navy is pressing development of jet fighters, there are no immediate plans for jet-propelled attack types on the theory that once aerial superiority is obtained by the jet fighters, conventional reciprocating engine bombers can work as effectively as jet types. Heavy, long-range transports continue as a Navy requirement and production orders for the giant Lockheed XR60-1 Constitution appear probable, particularly if a gas turbine powered version proves successful.

The Air Force plans expanded activity in the heavy transport field and this activity may be further expanded if the air policy recommendations for military development of commercial transports are followed. The Fairchild C-119 Packet, already in limited production, constitutes a basic type in Air Force and Ground Force planning and expanded production for this and similar types appears certain.

### Research

The astonishing fruitfulness of research, both basic and applied, in the past year has, more than any other single element, placed the industry in a strong position with new prototypes. The success of supersonic flight has assured acceleration of the supersonic fighter program during the year and has created the strong possibility that certain guided missile types will reach production. The various jet engines have been improved through research to a point not only increasing the output of existing types by as much as 60 per cent but enabling the construction and test of new units of far greater power than heretofore

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### AIRCRAFT PRODUCTION—1947

Month	Commercial			Value Military	Value Commercial	Value Total
	Military	Multi- Engine	Personal			
January	111	20	2,146	2,277	\$ 38,445,244	\$ 9,621,546 \$ 48,066,794
February	99	11	1,903	2,013	42,535,288	9,501,272 52,036,560
March	137	23	1,762	1,922	34,549,763	15,898,885 50,447,648
April	105	32	2,006	2,143	33,434,597	19,639,655 53,274,282
May	94	28	1,818	1,740	37,328,323	20,424,511 57,750,834
June	139	31	1,162	1,332	64,073,208	22,803,711 86,876,917
July	104	15	983	1,102	27,748,095	13,838,042 41,586,137
August	211	23	906	1,140	32,064,947	18,040,476 50,105,423
September	323	30	998	1,351	37,842,732	23,034,906 60,877,728
Total 1947 (estimated)	1,800	350	15,000	17,150	\$450,000,000	\$225,000,000 \$75,000,000

### AIRCRAFT ENGINE PRODUCTION—1947

Month	Military	Commercial	Total	Value Military	Value Commercial	Value Total
January	334	2,826	2,862	\$ 17,347,636	\$ 10,016,476	\$ 27,374,112
February	361	1,765	2,126	14,580,079	8,210,513	22,790,592
March	438	2,457	2,895	18,847,532	8,013,884	26,861,400
April	430	2,472	2,902	20,037,356	9,229,383	29,266,719
May	387	1,773	2,160	22,466,256	8,097,288	30,563,536
June	346	1,002	1,348	24,941,373	8,005,095	32,946,468
July	386	971	1,357	16,087,122	5,257,645	21,344,767
August	436	511	947	17,838,189	3,743,737	21,581,926
September	426	691	1,117	22,731,120	3,905,823	26,636,943
Total 1947	5,000	14,500	19,500	\$205,000,000	\$80,000,000	\$285,000,000

*Three-quarter front view of the new B-1-H Dodge tractor (128-in. wheelbase, 15,000 GVW) typifies styling of entire 1948 line.*



# Many Changes in Dodge Trucks

**1948 Features Include Advanced Styling, Improved Cabs,**

**Engines Forward, Cross Steering and Shorter Wheelbases**

A TOTAL of 235 model variations ranging from 4250 to 23,000 lb GVW and up to 40,000 lb GTW and including COE as well as conventional types gives the new Dodge "Job-Rated" truck line a rounded coverage of the commercial vehicle field. This compares with 175 model variations in 1947. In outward appearance the new trucks emphasize styling of advanced type which is carried out in the same theme on models of every capacity.

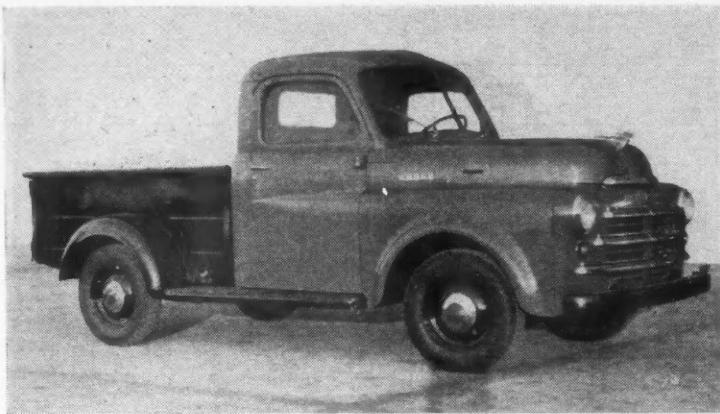
Noteworthy from the mechanical standpoint is that front axles have been moved back and engines forward. This places more of the chassis weight on the front axle and provides better weight distribution. The wheelbase for conventional models through the two-ton has been decreased by eight in., while the 2½- and 3-ton models have been reduced six in. Despite

## CONDENSED SPECIFICATIONS—NEW DODGE B-1 SERIES

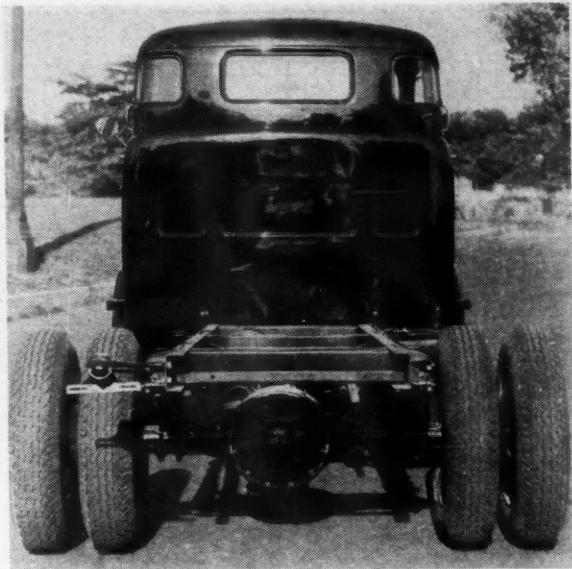
PREVIOUS MODEL	NOMINAL RATING	NEW MODEL	WHEELBASES AVAILABLE (in.)	GVW CHASSIS MODELS (lb)	GTW RATING (lb)
WC	1/2-Ton	B-1-B	108	4250-4500-4850	.....
WD-15	5/8-Ton	B-1-C	116	5500	.....
WD-20, 21	1-Ton	B-1-D	116-126	5500-6000-6800-7500	.....
WDX	1-Ton Power Wagon	B-1-PW	126	7600-8700	.....
WF	1½-Ton	B-1-F	128-152-170-192	7000-8000-9000-10,500-12,000-13,500-14,500	26,000
WFA	1½-Ton Dual Purpose	B-1-FA	128-152-170-192	10,500-12,000-13,500-14,500	26,000
WFM	1½-Ton COE	B-1-FM	107-131-161	7250-8250-9250-10,750-12,250-13,750-14,750	26,000
WFMA	1½-Ton COE Dual Purpose	B-1-FMA	107-131-161	10,750-12,250-13,750-14,750	26,000
WFX	1½-Ton	B-1-H	128-152-170-192	15,500	28,000
WFAX	1½-Ton Dual Purpose	B-1-HA	128-152-170-192	15,500	28,000
WFMX	1½-Ton COE	B-1-HM	107-131-161	15,750	28,000
WFMAX	1½-Ton COE Dual Purpose	B-1-HMA	107-131-161	15,750	28,000
WH	2-Ton	B-1-J	128-140-152-170-212	10,500-13,500-15,500-18,500	29,000
WHA	2-Ton Dual Purpose	B-1-JA	128-140-152-170-212	10,500-13,500-15,500-18,500	29,000
WHM	2-Ton COE	B-1-JM	107-131-161	10,750-13,750-15,750-16,750	29,000
WHMA	2-Ton COE Dual Purpose	B-1-JMA	107-131-161	10,750-13,750-15,750-16,750	29,000
WHAX	2-Ton Dual Purpose	B-1-KA	128-140-152-170-212	17,000	31,000
WHMAX	2-Ton COE Dual Purpose	B-1-KMA	107-131-161	17,250	31,000
WJ	2½-Ton	B-1-R	130-136-154-172-229	13,500-17,500-18,500	34,000
WJA	2½-Ton Dual Purpose	B-1-RA	130-136-154-172-229	13,500-17,500-18,500	34,000
WK	3-Ton	B-1-T	130-136-154-172-190	17,500-19,500-21,000	37,000
WKA	3-Ton Dual Purpose	B-1-TA	130-136-154-172-190	17,500-19,500-21,000	37,000
WR	3-Ton	B-1-V	130-136-154-172-190	23,000	40,000
WRA	3-Ton Dual Purpose	B-1-VA	130-136-154-172-190	23,000	40,000

the shorter wheelbases, the new trucks have been engineered so that previous standard CA dimensions remain practically unchanged, thus making it possible to use the same length bodies as before.

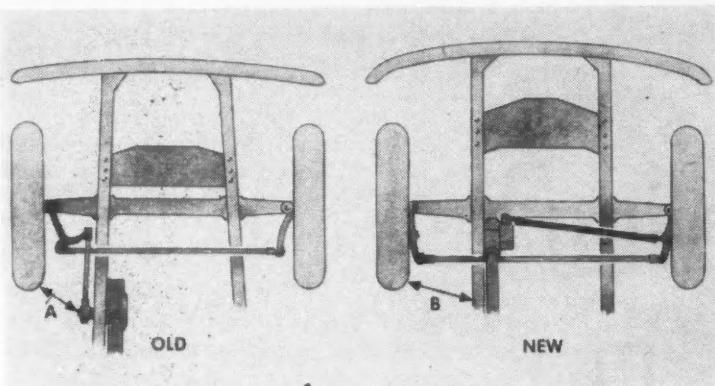
The shorter wheelbases and wider tread front axle,



New B-1-B Dodge pickup has 108-in. wheelbase and GVW rating up to 4850 lb.



Rear view of the Dodge B-1-FM COE of 107-in. wheelbase. Note the rear quarter windows, provided in all deluxe and custom cabs.



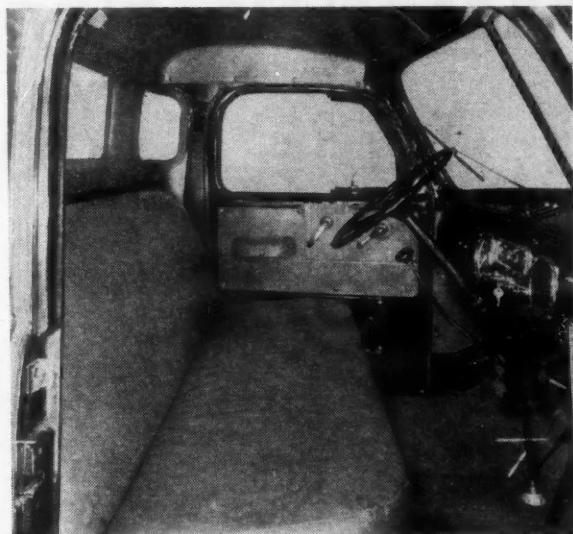
New cross-steering feature on all conventional models permits a 37-deg turning angle and 44-ft turning diameter.

together with cross steering, which is a new feature on all models except the COE's, provide new ease of handling and driving. The cross steering permits a 37-deg turning angle both right and left. Drivers now can park, back into alleys or up to loading platforms with much greater ease. Road shock through the steering wheel is greatly reduced by the cross steering, which has the drag link running parallel with the front axle.

#### New Cabs in Three Styles

In addition, new and longer cabs are provided. Dodge is particularly proud of its new cabs—standard, de luxe and custom models—which have been completely redesigned to give more room, more visibility, more safety, and more comfort for the driver. Comfort has been built into the completely new all-steel cabs. They are roomy and provide maximum comfort because of several new features including four-point mounting on rubber insulators. Seat width is 57 $\frac{1}{4}$  in. to permit three large men to ride without crowding. Ample head room is provided with 36 $\frac{1}{2}$  in. between seat and roof. The chair-height seats can be adjusted seven in. A convenient hand control is provided. Seats provide proper leg support under the knees, and the back support also is adjustable for maximum comfort.

The Air-O-Ride seat cushion utilizes air in combination with coil springs to provide comfort. It also has

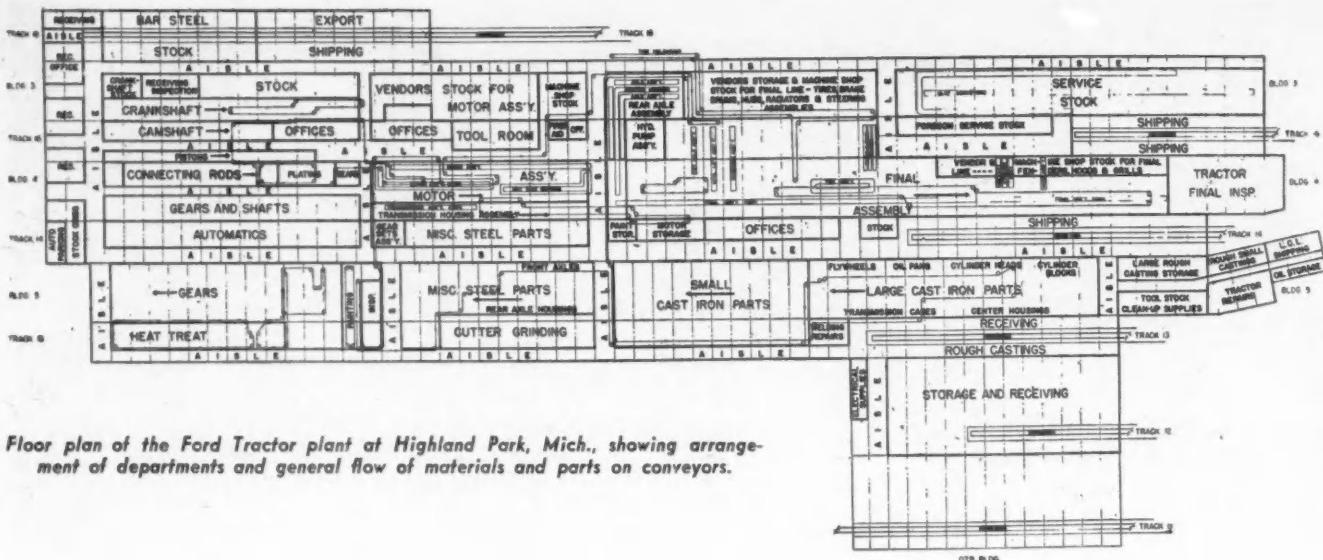


Cab seat is now 57 $\frac{1}{4}$  in. wide and has "Air-O-Ride" cushions utilizing air in combination with coil springs. Buoyancy of the new cushions can be regulated by a hand control.

a long life because the cushion of air reduces wear on the springs. A hand control permits the driver to adjust the cushion buoyancy to his weight or road conditions.

An all-weather heating and ventilating system for comfort in any season or weather is available. It is an ingenious combination of truck heater, defroster vents, vent windows, cowl ventilator, and a fresh air intake from behind the front radiator grille. The de luxe and custom cabs, supplied as optional equipment, have what is termed "360-deg" vision through increased glass area and the installation of rear quarter windows. Windshields and windows of the new "Pilot-House" Dodge cabs are higher and wider, add-

(Turn to page 62, please)



Floor plan of the Ford Tractor plant at Highland Park, Mich., showing arrangement of departments and general flow of materials and parts on conveyors.

# Materials Handling a Prime Factor in Ford Tractor Production

By Joseph Geschelin

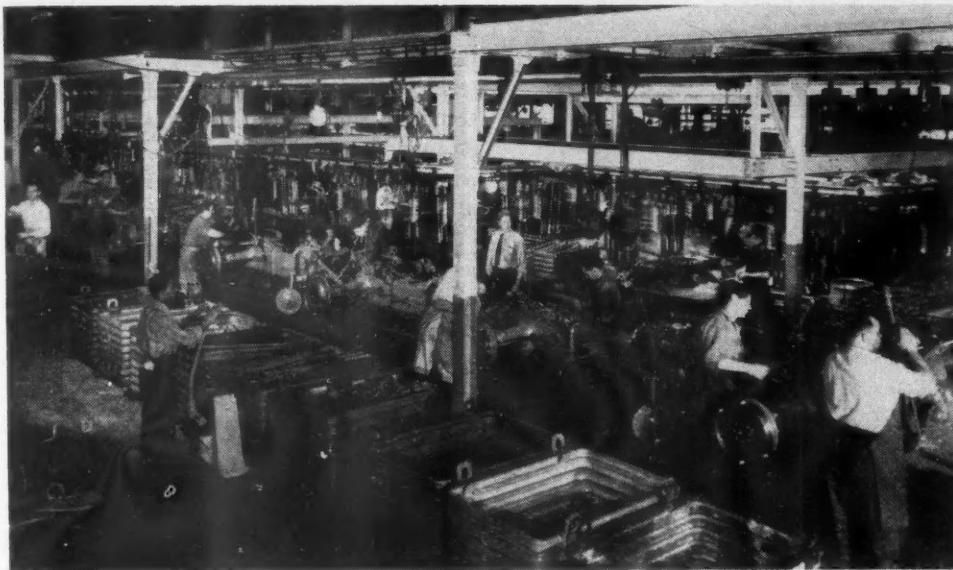
WHEN Ford Motor Company decided to move its entire tractor manufacturing operation to Highland Park — present home of the Ford truck—the management seized upon the opportunity to centralize all phases of the operation under one roof with the attendant economies inherent in a set-up of that character. In the process of laying out the major departments in an area of some 385,000 sq ft of floor space, therefore, painstaking attention was given to the flow of materials and the allied problem of organizing materials handling.

This study is concerned primarily with the major phases of materials handling as they have developed up to the present writing. Materials handling, as it is considered today, is intimately linked with the layout of manufacturing departments and their relation to receiving and shipping bays and storage banks and, in effect, controls the floor plan layout according to the prearranged flow of materials and operations. The right solution for a given plant holds a promise of

greatest possible economy equal to that of advanced production methods.

It may be noted at the outset that tractor building at Highland Park includes the manufacture of virtually every element of the machine—the engine and its components, the transmission and power train, the final assembly of the tractor ready for shipment over the highway or by rail.

That the major departments have been arranged in a logical sequence is evidenced by an examination of the floor plan. The first of these departments is that for "large cast iron parts" machining, first because it was found most economical to place it directly at the point at which the heavy castings are received by truck and rail from outside sources either the River Rouge or an outside foundry. Thus the movement of heavy parts is minimized at the very start. Next is the "small cast iron parts" machining department. Among the others are: gear and shaft production, miscellaneous steel parts, camshaft and crankshaft



(Left) A view of a portion of the final tractor assembly line on the waist-high power driven conveyor.

(Below) Perspective of the compact piston machine line, showing the belt conveyor that links all operations. Note the dams across the belt designed to hold the pistons for feeding into an individual machine; also the discharge from a machine onto the belt which may be seen in the background at the right.

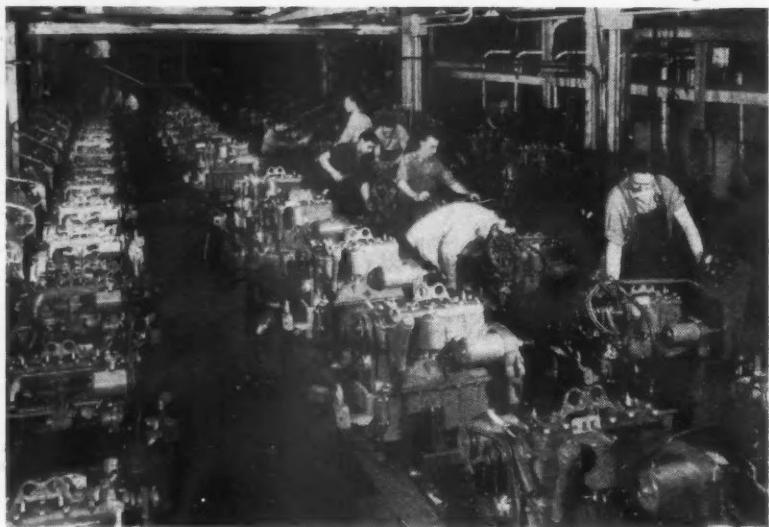
production, engine assembly and block testing, transmission assembly and testing, final assembly department, and heat treating. Interspersed among these are self-contained departments for making detail parts such as the pistons.

The final assembly line has the usual sub-assembly lines placed at right angles to the main line directly at the points of application of units such as the rear axle, steering gear, radiators, and hood assembly.

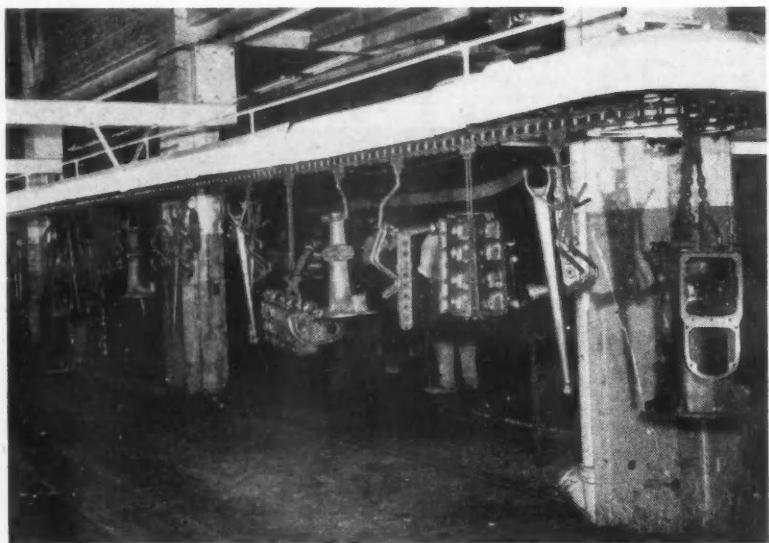
Materials handling facilities may be visualized more easily by considering them according to function. The practice is to utilize bulk handling methods of all parts regardless of size, insisting upon pallets of various kinds suitable for the compact movement of castings and sub-assemblies by means of fork trucks. Smaller parts are stored and transported in large containers or tubs. Whether the raw castings are large or small they are handled on pallets and delivered on pallets to the starting points of the machine lines. The pallets are tiered on gravity roller conveyor sections serving each of these lines. Individual parts are readily transferred to the first operation machine by means of a boom-mounted electric hoist. That is the general character of first operation handling.

Once the parts are in process they continue in straight line flow from one operation to another in the respective departments. At the end of each line the finish-machined parts are transferred to a heavy duty monorail conveyor which links every plant and department of the

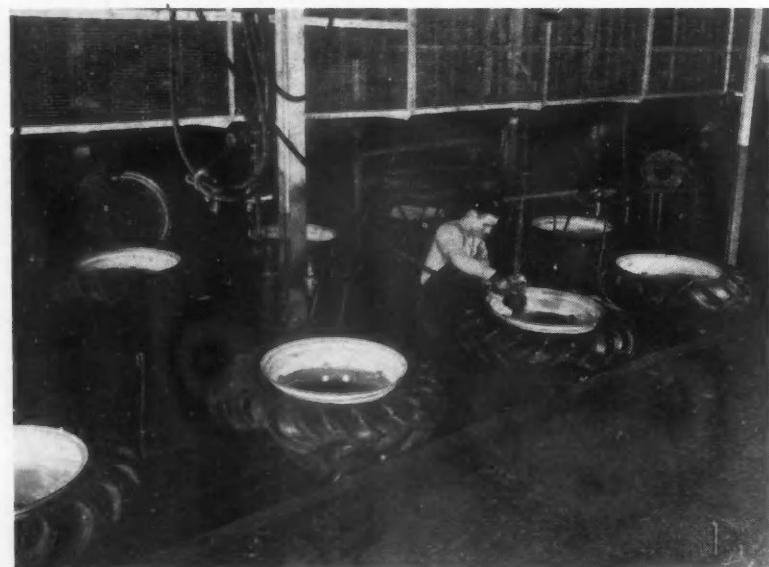




Here is the block-testing of Ford tractor engines.



One section of the 2955-foot long inter-plant monorail conveyor showing the variety of parts that it carries.



This is the merry-go-round conveyor for wheel and tire assembly and inflation.

tractor division. It carries cylinder blocks, transmission cases, gears and shafts clustered in special wire containers to prevent damage, crankshafts, etc. Smaller conveyor lines take care of the transportation of parts from one operation to another within certain departments.

An interesting example of the latter is found in the arrangement of the piston machine line. Here all the machines required for the operation are compacted into a short straight line which is fed and linked by a power driven belt conveyor. Starting with the rough castings, pistons move on the belt progressively from one machine to another. At each machine the through flow is blocked by a steel strip which acts as a dam, piling up the work at the machine to permit the operator to feed his machine without interruption. However, as the operation is completed the work is ejected automatically from the machine into a chute which deposits the parts onto the belt for transport to the next operation.

It was found most economical to locate the assembly of engines and transmissions in the same area, adjacent and parallel to each other. Thus the heaviest elements of the tractor — the cylinder block and the large transmission case — are removed from the long feeder monorail conveyor at about the same point, thus preventing congestion and overloading of this important transportation link.

Incidentally, the path of the main conveyor is so designed as to carry all of the parts progressively through two washing machines; and for parts that are painted before assembly through Hydro-Spray booths and their attendant infra-red tunnel drying ovens.

Motor assembly is handled on a group of associated power driven chain conveyors for each stage of assembly, the sub-assembly being transferred from one line to the next by means of electric hoists. In this process, engines move to the block test for a 15-minute run, then to the final assembly of accessories, and lastly through the paint spray booths and infra-red drying tunnels.

Similarly, the transmission is integrated on its power-driven chain assembly line and goes directly into the "quiet" room for testing at operating speed.

The flow of finished sub-assemblies and component parts is directed to the final assembly line nearby. Here the large units such as the engine and transmission are delivered and transferred to the final line by an electric hoist running on an

overhead rail. The final line is in two major sections although actually in a single straight line arrangement. The first section takes the assembly of the backbone and carries it through the paint spray booths and infra-red drying tunnel. The second section completes the assembly of sheet metal, instrument panels, wheels and tires, etc., ready for the final test for acceptance and delivery.

As mentioned earlier, the final line has a network of sub-assembly feeder conveyor lines at the side. On these are built up the steering gear, rear axle, sheet metal assemblies ready for unit installation, and similar units. In each case, the material is delivered to the final line by means of an electric hoist.

The wheel and tire conveyor starts at the freight dock. The wheels and tires are taken out of freight cars and loaded onto the monorail for transport to the wheel and tire assembly and inflation stations. When the assembly is completed on the merry-go-round wheel and tire line, it is loaded on the conveyor for delivery to the final assembly line and to the storage bank.

Since operational economy in this plant is derived largely through planned materials handling, particular attention has been given to the means for moving raw materials. Generally speaking all incoming material is handled in the plant in tubs and containers or on pallets. However, unless the process is extended to every phase of the job including what is done by the supplier, maximum economy cannot be achieved. For instance, if the supplier does not follow Ford practice, parts are likely to be received in haphazard fashion in trucks and cars. This makes unloading by hand necessary and takes considerable time and effort. Accordingly, the Ford organization has carried on an educational campaign to get its suppliers to pack parts compactly on pallets and in containers, and has even gone to the extent of supplying some of its sources with pallets and other devices designed and made by Ford.

Just one example may suffice to show why the organization has placed so much emphasis on palletizing both in the plant and by suppliers. Crankshafts formerly were received loose — 425 pieces being thrown loosely into a trailer. Unloading of the trailer required five materials handlers and one checker, four hours each. After the adoption of palletizing it required just one Hi-Lo driver, one material handler, and one checker, 17 minutes each for unloading. This represents a saving of 23-manhours for each load of 425 crankshafts.

Another source of economy is found in the common-



Shown in this view is a portion of the tractor engine final assembly line.

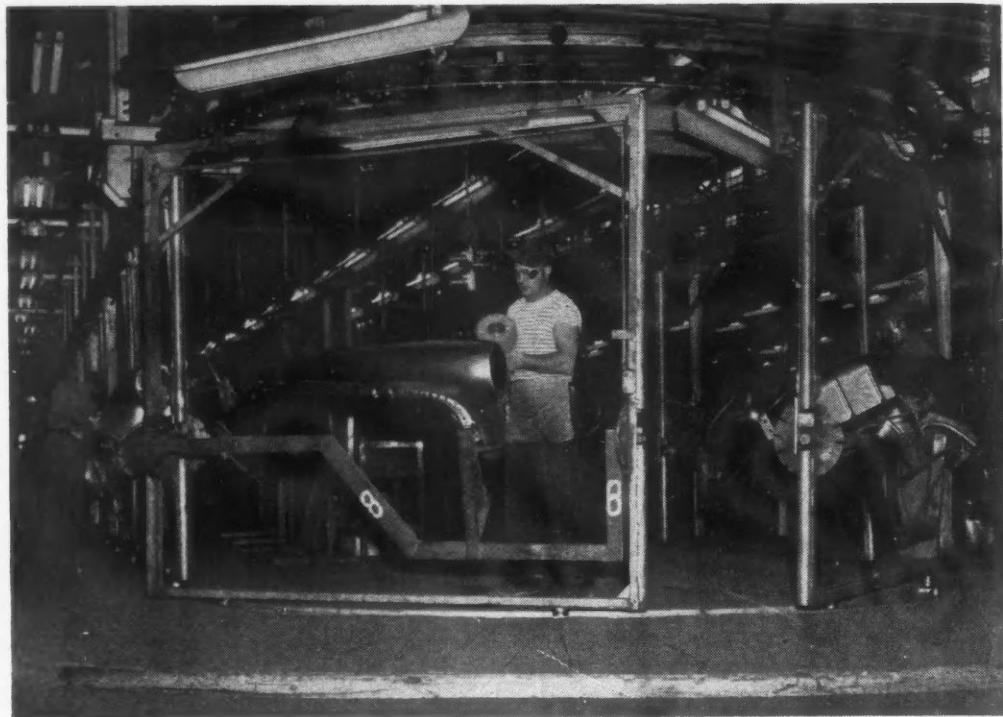


Tractor spare parts and replacement parts are collected and stored in a conveniently located stock room, ready to fill dealers' orders. The pallet conveyor may be seen in the center. The radiators in the foreground exemplify the palletizing method of handling throughout.

sense method of handling sheet metal parts such as fenders, radiator shells, etc., which are painted by an outside vendor. To facilitate handling at both ends and at the same time to prevent marring or damage of nicely painted parts, Ford designed and built special steel racks of different forms to suit the shape of each

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*Typical of a group of merry-go-round lines installed in the Buick sheet metal plant is this one for the metal finishing and detail welding operations on fenders. Portable bicycle tools are found along this line.*



# Buick's New Sheet Metal Plant Features Energy Saving Equipment

## Escalators, Miles of Overhead Conveyors and Merry-Go-Round

## Lines Incorporated in Large Four-Story Structure at Flint

**D**OUBTLESS one of the finest and most advanced operations of its kind to be found in the automotive industries is the new sheet metal plant recently placed in operation by the Buick Motor Division at Flint, Mich. Housed in a magnificent four-story structure of modern design, the plant some 1600 ft in length boasts extra high ceilings to leave ample clearance for towering presses and process equipment. An unusual feature for an industrial building is the provision of a group of four escalators, placed in convenient locations, serving as step savers for the workers.

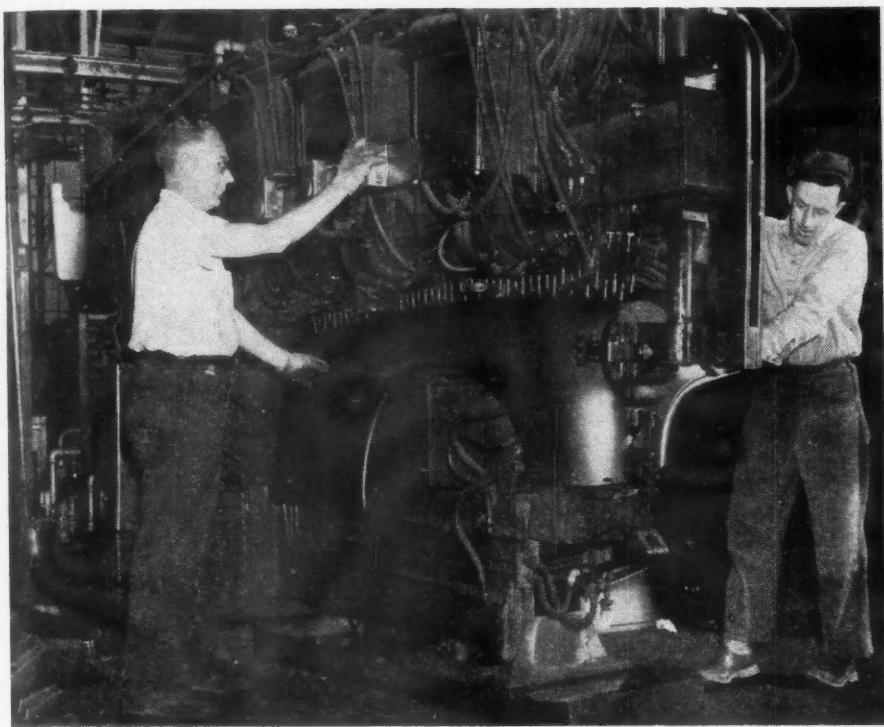
At the present writing the plant is set up for handling fenders, hoods, and the variety of miscellaneous sheet metal parts that go into a Buick car. Fenders, hoods, and the other parts are stamped in the press shop, fenders and hoods being finished and given undercoat treatment in preparation for color

painting which is done in another department. The gamut of activity includes: press operation, metal finishing, welding, painting and drying.

Literally miles of overhead conveyors link the operations on every floor, transporting sheet metal parts from one operation to another and carrying the finished parts to the shipping bays. Some of the major overhead conveyor lines are listed below as a sampling of materials handling facilities:

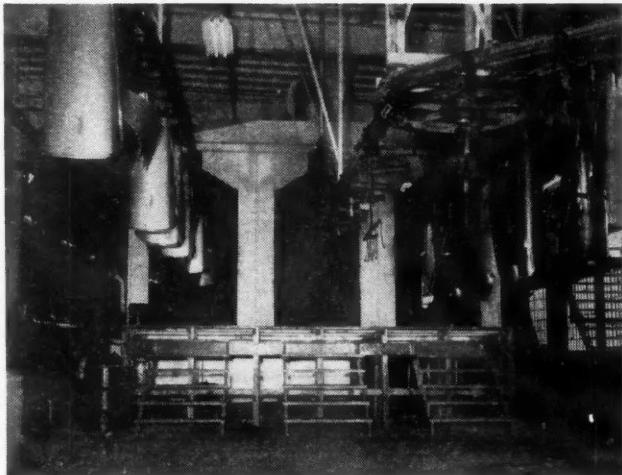
Hood conveyor (raw)	4620 ft
Fender conveyor (raw)	4420 ft
Miscellaneous conveyor (raw)	4200 ft
BOP parts conveyor	3300 ft
Miscellaneous Bonderize line	3040 ft
Fender Bonderize line	3180 ft
Hood Bonderize line	4192 ft

To provide a quick sampling of activity, this article



*Close-up of piano-type multiple spot resistance welder on the 1948 Buick fender line. Front fenders this year are made in two pieces, the machine being used to join the inner and outer panels. Individual guns are employed for making each spot, the guns being fired alternately from a battery of six transformers.*

*(Below) Here are the three principal conveyor lines in the finishing department—front fenders, rear fenders, miscellaneous parts—entering the big Newcomb-Detroit Bonderizing unit. Upon leaving this machine, the conveyors continue to the drying ovens on the floor above.*



is confined to a study of some of the major steps in handling hoods and fenders. These parts are delivered on the "raw" conveyors mentioned above from the press shop and proceed, first, to the metal finishing merry-go-round lines—one line for fenders, the other for hoods. In the case of fenders, which are made in two sections and require considerable welding, the two sections are first welded together in automatic resistance welders before going to metal finish. On the metal finishing line fenders not only are finished, but also are given some detail torch welding operations. The use of merry-go-round lines for metal finishing is instrumental in providing compactness of space and uniformity of operational sequence, facilitating the work of the operators through the application of well-designed trunnion-type workholding fixtures. Everything possible has been done to ease the task of operators and contribute to quality.

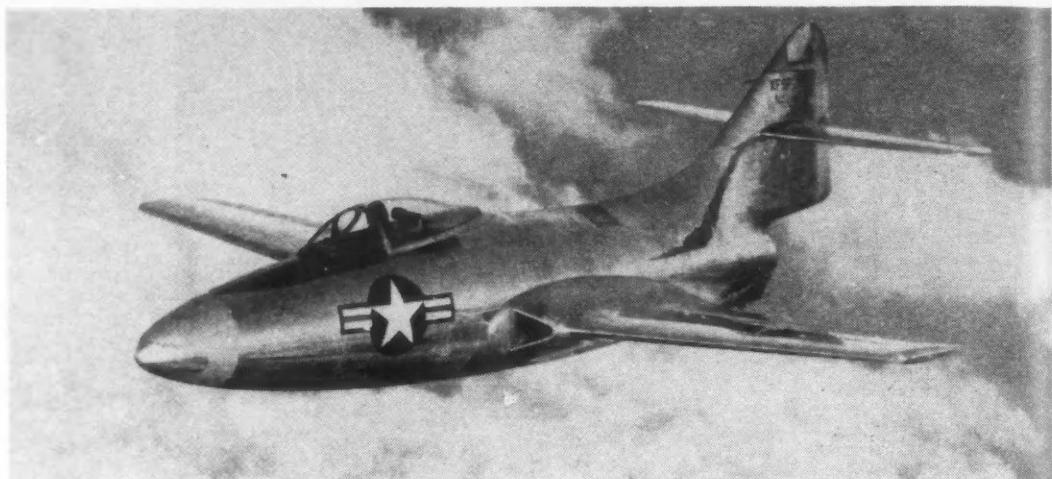
Following metal finish the fenders and hoods, each on their own conveyor, are joined by the miscellaneous parts conveyor and the three conveyors then move in concert into the enormous Bonderizing unit installed by Newcomb-Detroit. This unit contains three parallel tunnels, is 20 ft wide and 192 ft in length. Here the work is automatically washed, cleaned, rinsed, and Bonderized. The conveyors continue through the unit and as they leave the exit end they bend upward for transport through the dry-off oven on the next floor. Immediately at the exit end of the Bonderizing machine there is a short covered section under the conveyor line to catch the dripping from the work, constituting a drain interval which relieves the dry-off oven of considerable load.

Upon leaving the drying oven the conveyors return to the lower floor and carry the load through a rubber coat dip unit. This black prime undercoating is paint receptive but serves, at the same time, to provide a finish for the inside surfaces of fenders and hoods.

At this stage the miscellaneous parts conveyor shapes its course to the shipping dock for transport to the assembly building. The fender and hood conveyors, on the other hand, continue their course through the paint shop. They lead first to the battery of Newcomb-Detroit water wash spray booths where the hoods and fenders are sprayed with the surfacer coating, then move upward through an opening in the ceiling into the sealed Newcomb-Detroit drying ovens on the fourth floor.

Unique feature of the fourth floor drying oven in  
(Turn to page 64, please)

*Grumman Panther, the Navy's newest jet fighter for carrier-based operation, has a top speed approaching 650 mph (Official U. S. Navy photo)*

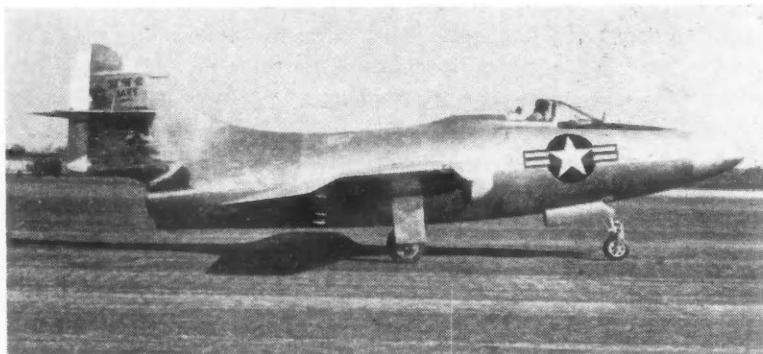


## Panther 650 Mph Fighter Solves Jet Carrier Problem

By Robert McLaren

SLOW acceleration and long takeoff run requirements, the major operational problems of carrier-borne jet fighter, have been licked by Grumman Aircraft Engineering Corp.'s radical new fighter, the XF9F-2 Panther. Secret of the craft is a series of small retractable doors in the aft fuselage which open to permit a flow of air from the jet intake through the engine compartment and out the doors to the atmosphere. By thus "ventilating" the plenum chamber containing the engine, Grumman has provided a high flow of air to the engine at low forward speeds, during takeoff and landing, and produced a high speed jet fighter which takes off in 450 ft and lands at only 80-85 mph, as compared to 4000 ft in still air and 130 mph for other jet fighters. The Navy has already slated the F9F for quantity production over several years, at a time when only a few hours of flight test have been recorded on the airplane.

The Panther is capable of a top speed approaching 650 mph, and an operational ceiling above 45,000 ft. This astonishing performance, achieved recently by the Douglas D-558, is made possible by a British Rolls-Royce Nene engine, which develops 5000 lb of static thrust dry and 5750 lb static thrust with water injec-



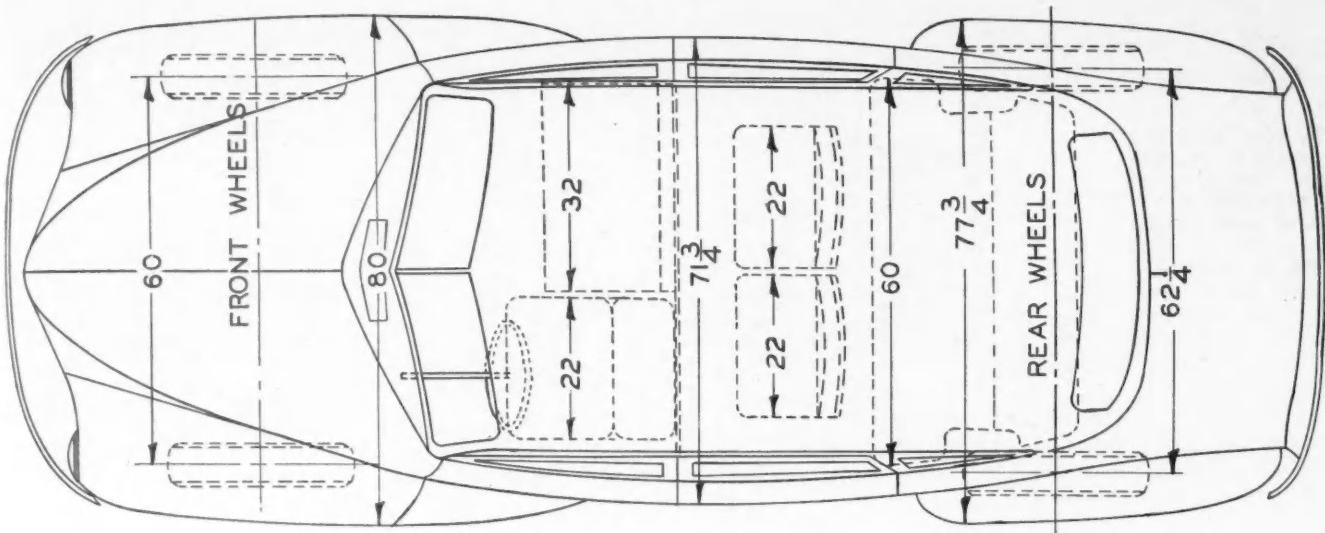
*The Panther ready for takeoff run. Note one of two open doors for air outlet to permit short takeoff run of 450 ft. Landing speed is 80-85 mph. (Special photo by Harold G. Martin)*

tion. These engines will be shortly in production by Pratt & Whitney Aircraft Div. of United Aircraft Corp. First test engine is to be completed in March, 1948, and full-scale production is scheduled for October, 1948.

An alternate engine, completely interchangeable in the field with the Nene, is the new Allison J-33-8, which will be installed experimentally in the third prototype XF9F-2. The second, scheduled for completion February, 1948, will also be powered by a Rolls-Royce Nene, a small quantity of which was imported from England by Grumman for these prototype aircraft.

Grumman engineers, Dick Hutton, Bob Hall and Gordon Israel, the latter two men well-known air

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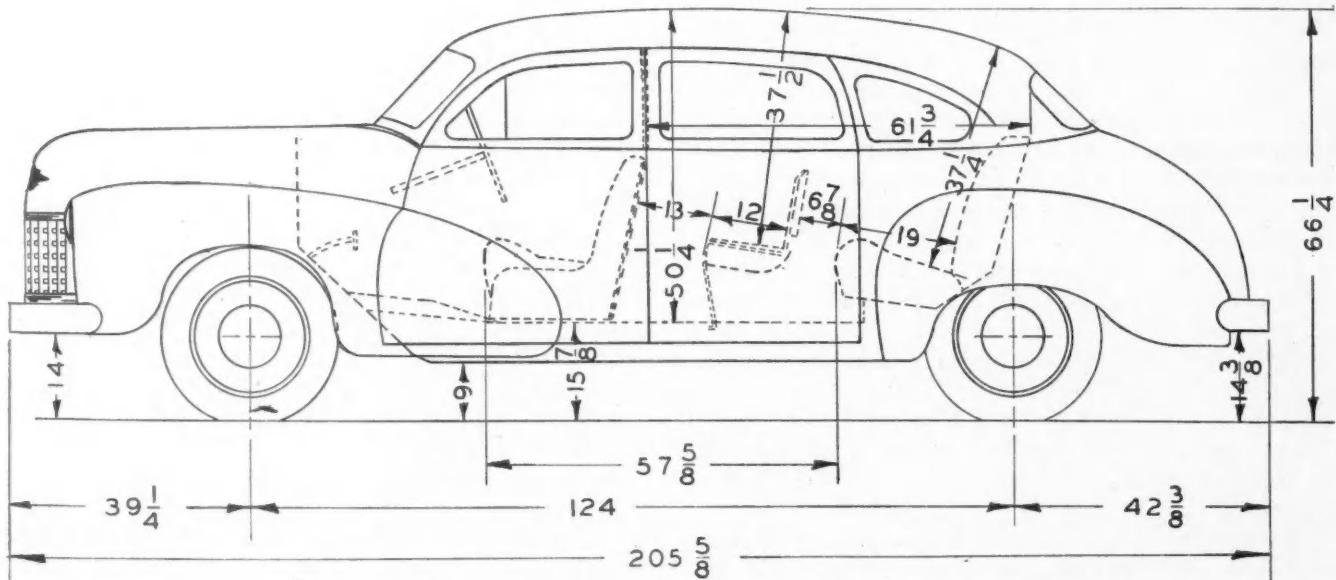


**SPECIFICATIONS OF CHECKER MODEL A2 TAXICAB**

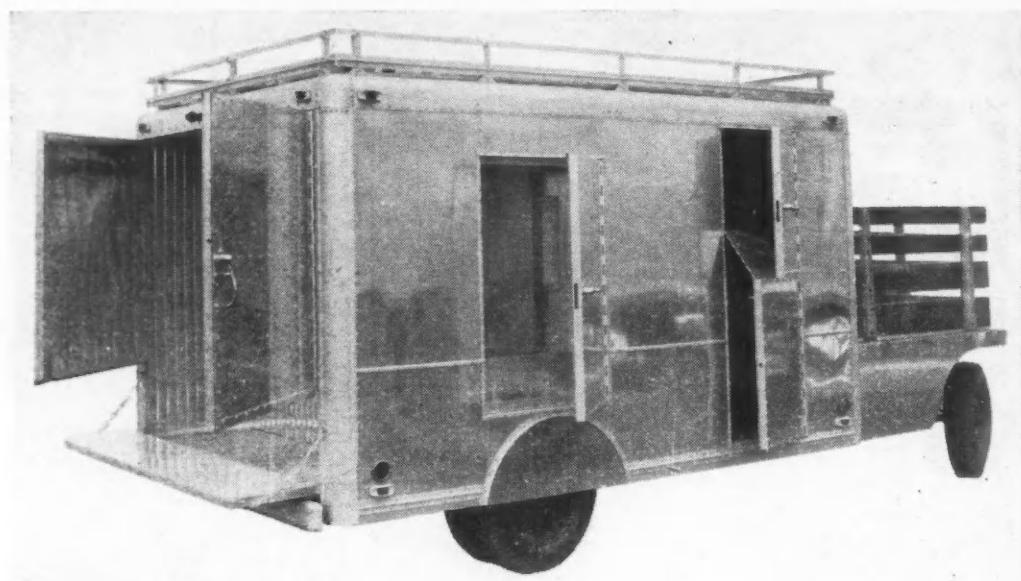
Engine	Continental CF6226 L-head
Type	Continental CF6226 L-head
No. cylinders	Six
Bore	3 5/16 in.
Stroke	4 1/8 in.
Displacement	226 cu in.
Compression ratio	6 to 1
Power rating	26.3 hp SAE
Torque	170 lb-ft
No. of Main bearings	4
Oiling system	Full pressure
Clutch	Borg and Beck 10-in. diam.
Transmission	Warner Gear T86
Brakes	Wagner hydraulic
Front axle	Reversed Elliot type
Rear axle	Spicer semi-floating
Suspension	Semi-elliptic springs front and rear, double-acting hydraulic shock absorbers
Steering gear	Ross cam and twin lever type, Model TA-14
Wheels	Budd steel balanced with drop-center rims. 6.50-16, 6-ply balloon tires
Wheelbase	124 in.
Overall length	206 in.
Tread	60-in. front; 62 1/2-in. rear

## Latest Checker Cab

**N**ow in production at the Checker Cab Manufacturing Corp., Kalamazoo, Mich., is a new five-passenger taxicab, preliminary announcement of which was made in the Dec. 15 issue of AUTOMOTIVE INDUSTRIES, page 18. It features a shorter overall length than previous models and improved riding characteristics, the latter being attributable to better weight distribution obtained by placing the centerline of the engine well ahead of the centerline of the front axle. Other details of the new Checker cab are given in the accompanying drawings and table of specifications.



This 35-ft semi-trailer was built by the Aluminum Body Corp. of prefabricated extruded aluminum sections. It weighs about 3000 lb less than a similar trailer of wood or steel.



# Aircraft Know-How Applied to Truck Aluminum Bodies

By R. W. Graham

Chief Metallurgist, Aluminum & Brass Div.,  
Harvey Machine Co., Inc.

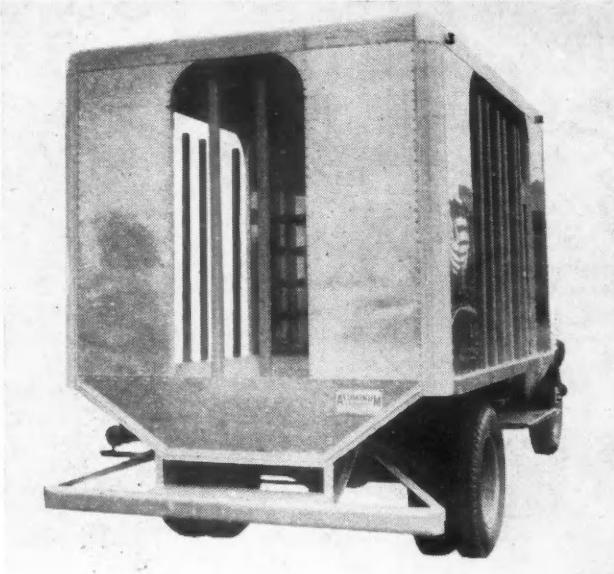
OF THE thousands of workers, engineers, and others who gained experience with aluminum in the West Coast's vast aircraft industry during the war, it is only natural that many should seek to apply their experience with this metal in the building of civilian products. One industry which is taking advantage of this experience is the truck body and trailer manufacturers. Aluminum is now rapidly on the way to becoming the standard structural material in this industry.

The all-aluminum truck and trailer bodies produced by the Aluminum Body Corp. in Los Angeles are good examples of a superior product made from aluminum, using designs and assembly methods based on aircraft experiences of both management and workers. This company is now producing a full line of all aluminum bodies from small refrigerator bodies to be mounted on jeeps or motor scooters to giant 35-ft long semi-trailers.

The structural parts of these bodies are 100 per cent aluminum sheet and extruded shapes of heat treated

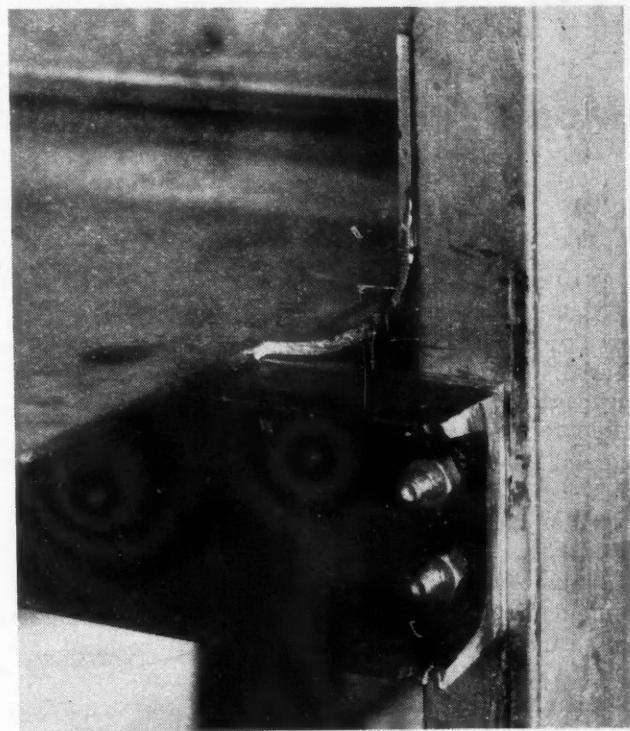
alloys. The basic framework is designed around and assembled from aluminum alloy extruded shapes. In both design and assembly, aluminum extruded shapes are treated as prefabricated parts. It is this concept or treatment of aluminum extrusions as prefabricated parts that permits the higher cost of aluminum over other materials to be absorbed through design and assembly savings.

Aluminum extruded shapes are made by forcing an aluminum billet, heated to a plastic state, through a die in which the opening corresponds to the shape desired in the section. In the extrusion of intricate shapes, it is not always possible to hold the cross section within commercial tolerances so that a finishing or shaping operation may be necessary. Such a finishing operation generally consists of roll forming the shape to final dimensions, but Harvey Machine has adopted a practice of drawing the shape to accomplish this result. Production of extruded shapes to close dimensional tolerances puts them in the class of prefabricated parts, for they can be assembled with



(Left) Aluminum truck body built of prefabricated sections.

(Below) This photo shows a heavy aluminum floor formed at the edge for riveting to side channels. Riveting to floor channel and side channel forms a gusset tie-in.



other shapes or other parts without further processing by the user.

All standard shapes such as angles, channels, tees, zees are produced by the extrusion method, but the benefit derived from the extrusion process is in the production of special shapes. Quite often the only extra cost of a special shape over a standard shape is the original die service charge. The main advantage of a special shape is that it may be designed to fit exactly the job required of it, or it may be designed to replace one or more standard shapes with reduction in weight, cost, and assembly time. Extruded shapes are produced in open, semi-closed and closed forms. Except for minimum wall thicknesses and overall circle size, they may be in almost any form a designer may require.

Special shapes have been designed by the Aluminum Body Corp. for each particular function of the body structure. Bulb channels, roof rolls, corner posts, door plates and roof carlines are specially designed extruded sections for each particular job. The main load members are of 24ST alloy, and secondary members are of 61ST. Drip troughs and molding are of 63ST5 alloy. Floor plates, side and roof covering are alclad 24ST. Mechanical property specifications for the various alloys used are given in Table I. The floor plates are 0.156 in. thick alclad 24ST plate. The plates are formed along the outside edges of the floor to make a three-in. vertical section which is riveted to the side channels. The side channels are also riveted to the cross members forming a gusset tie-in. On low skirted bodies, a second gusset tie-in is made between the side channels and cross members beneath the floor.

The light weight of aluminum permits the use of heavy extruded sections in the roof, giving rigidity

TABLE I—PROPERTIES OF ALUMINUM EXTRUDED SECTIONS

Alloy and Temper	Tensile Strength Psi	Yield Strength Psi	Elongation Per Cent in 2 in.	Shearing Strength Psi
• 24ST	68,000	48,000	19	41,000
•• 61ST	45,000	40,000	12	30,000
••• 63ST5	31,000	24,000	14	19,000

\* Cross members, side channels, door plates.

\*\* Roof rolls, corner posts, carlines.

\*\*\* Drip troughs, trim, non-structural uses.

and strength to the section of the body without unduly raising the center of gravity. Roof rolls are 0.156 in. thick extruded 61ST sections, and are riveted to 24ST side channels and 61ST extruded roof carlines. Connection between the roof rolls and corner posts is made by means of corner castings of heat treated aluminum alloy. This heavy roof construction contributes generally to the strength of the whole body and is of special advantage in certain types of bodies such as on meat trucks in which it is often desirable

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# Ford 100 Hp Truck Engine Modified to Give 175 Hp

A MEANS of raising the power output of a standard Ford V-8 truck engine has been developed by the Ardyn Mechanical Corp., New York, N. Y. This modification, which was announced in the Sept. 1 issue of AUTOMOTIVE INDUSTRIES, page 67, is claimed to boost the normal 100-hp output of the 239.4 cu in. Ford V-8 engine to 160 hp at the same operating speed of 4000 rpm and to 175 hp at a speed of 5200 rpm.

Main components of the Ardyn modification consist of cast aluminum alloy heads, dual carburetors, aluminum manifolding and induction system, radially-inclined overhead intake and exhaust valves with dual valve springs, rocker arms and push rods, aluminum valve cover, and extension pipes fitted around the spark plugs to protect them from valve gear lubricating oil. This assembly, installed on a standard 100-hp Ford V-8 truck engine block, is shown in the sectional drawing, Fig. 1.

The cylinder heads of the Ardyn modification, cast from high-tensile heat-treated Alcoa aluminum alloy, were designed with enlarged intake valve ports, and with the opening for the spark plug located in the center of the combustion chamber. This arrangement is claimed to result in high thermodynamic efficiency. Compression ratio of the Ardyn engine, through the use of

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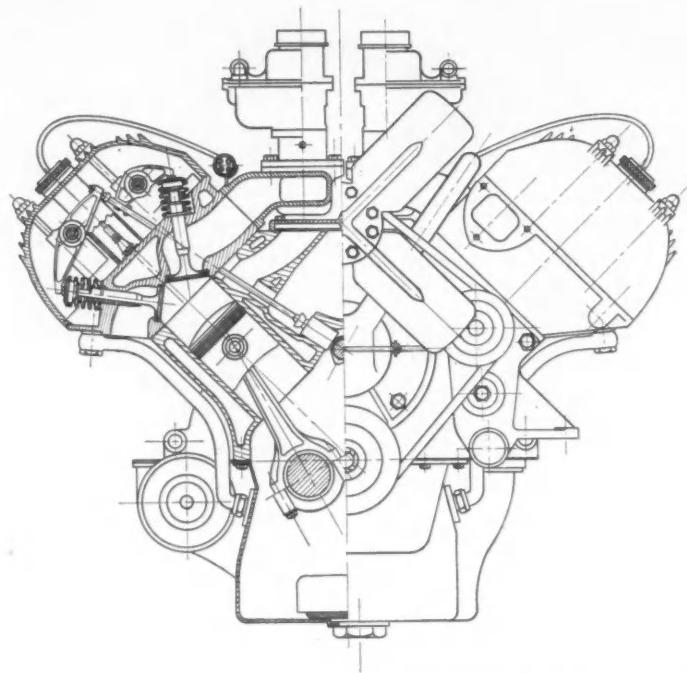
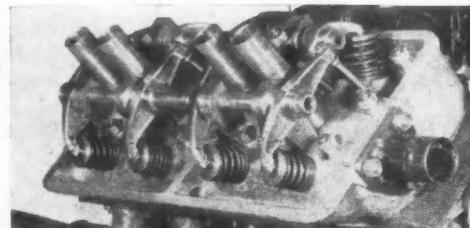
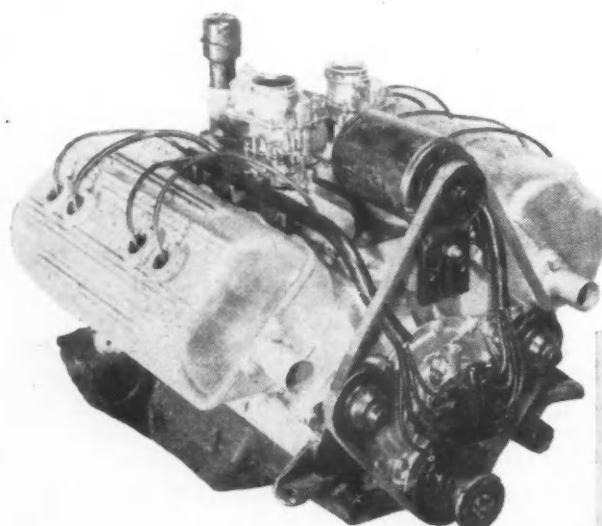


Fig. 1—The Ardyn modification, a standard Ford V-8 truck engine with overhead valves, hemispherical combustion chambers and dual carburetors, is shown in this transverse half-sectional drawing.

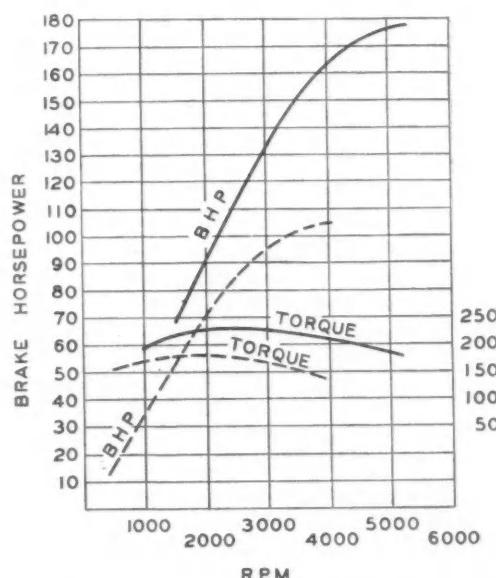


Fig. 2—Performance curves of the Ardyn engine are shown by the solid lines, while data for the standard 100-hp. Ford V-8 truck engine are indicated by the dotted curves. Tests for the Ardyn engine were made with water pumps and exhaust muffler but without fan or generator, using 67 octane gasoline. Tests for the standard Ford engine were made with water pumps and generator, but without fan or muffler.

Front view of latest Ardyn-modified Ford truck engine. Inset shows details of overhead valves and four tubes projecting from cylinder head that serve to enclose spark plugs.

# Aircraft Industry Outlook

## Bright for 1948

(Continued from page 33)

anticipated. It is the success of the turbine research program that outmoded the promising "compound engine" before it had even passed the block test stage. The turboprop program, virtually stalled during the past year, should receive exceptional prominence during this year with more than a dozen different units nearing completion of tests. The long-secret Supersonic Research Center should be well under way during the year providing a considerable expansion of present supersonic research facilities with accompanying increase in research progress in this field. With the supersonic aircraft already a reality, main emphasis in the coming years will be supersonic guided missiles of long range and adequate accuracy.

### Personal Aircraft

Only dark spot on the 1948 aircraft manufacturing industry horizon is the personal aircraft production field, which has steadily declined the past year. A major factor in this critical picture is the virtual collapse of the small airport building program of the Civil Aeronautics Administration through sheer negligence and incompetence in the promotion of the matching-funds program. With no place to fly, private aircraft owners simply do not fly. The market for the heretofore popular two-place type appears saturated with virtually brand new aircraft for sale at used prices as low as 50 per cent of new. This situation has wreaked havoc with the new plane market. Offsetting this factor, however, is the growing production market for four-place "family" types, which are holding up the airframe weight and dollar sales figures for those firms building both types. The outlook for 1948 is for a personal plane production only one-half that of 1947 with business customers occupying an increasingly large percentage of the total sales.

### Helicopters

The year should witness continued expansion of the helicopter industry in both the military and commercial field. Production during 1947 centered largely in two companies: Sikorsky Aircraft Division, United Aircraft Corp. (28 commercial sales, 50 military) and Bell Aircraft Corp. (97 commercial, 18 military). These two pioneering companies now offer both two-place and four-place models for com-

mercial sale but the prices still hold firm at an extraordinarily high figure. A slowly rising market will soften this price structure and 1950 has been set as the goal year for a concerted promotion of the average man's market (\$10,000 to \$15,000). Military business will continue to constitute the bulk of the income in this field, which is quickly thinning out from its former level of 30 different companies.

### Airlines

The health of the airline is the determinant in the transport manufacturing field and the former remains highly uncertain. Airline traffic and revenue continues to fall with no strong indications of stability until mid-year. As a result the airlines are desperately seeking financial assistance in a variety of quarters, including government. Transport production hinges wholly on the outcome of current equipment financing efforts. Informed observers, both industry and airline, are certain that landing aids are the sole salvation of the industry insofar as they should quickly diminish the fatal crashes that are responsible for the current low traffic volume. On the basis of airline orders now in hand, transport production should approximately equal that of the past year with dollar volume upward, reflecting larger and heavier transport types.

### Export

During 1947 the industry exported \$60,000,000 worth of aeronautical material made up of about \$46,000,000 from the aircraft industry and about \$14,000,000 from the aircraft engine industry. Industry and foreign trade experts refuse any detailed analysis of this market for 1948 due to the uncertain factors involved. The troubled international money market accounts largely for this uncertainty and the shortage of American dollars abroad has prohibited the completion of several large transport orders placed by foreign airlines. Efforts are being made by the industry to create some form of international financing of aircraft purchasing on the basis of its beneficial effects on both our own industry and the communication systems of foreign nations. Progress is already reported along this line and a solution would not only improve the aircraft export picture but strengthen transport production outlook. The personal aircraft industry is expected to make an extremely belated but strong effort

in the export field but the two-year delay already on the record has introduced strong British and, to a lesser extent, French competition in this field. The aircraft engine export field promises to hold firm, however, due to the clear superiority of American types.

### Finances

The aircraft manufacturing industry operated at a loss during 1947 estimated at more than \$80,000,000. Tax carryback provisions will reduce this loss on the books to about \$12,000,000. This loss also includes liberal transfers from surplus and special postwar reserve accounts, all operating to deplete the industry's reserve capital. While the carryback privilege will not be available in 1948, the industry anticipates greatly reduced losses in nearly all cases and profits in selected companies especially strong in their individual field.

These losses were largely incurred in experimental production, research and development work on new types, which are now available for military procurement. These losses also worked to improve economy in industry operations as manifest, for example, in the steadily declining payroll. Most observers feel that the past year substantially completes the postwar dislocation and associated conversion costs and that the industry's books are now cleared of these unpredictables. Numerous companies have left the field, largely in the personal aircraft, helicopter and small transport activities. Many companies have abandoned their non-aeronautical activities, in which considerable losses occurred in many cases. The future trend in such activities remains unclear with such companies as Curtiss-Wright, Bell Aircraft and others expanding their non-aeronautical efforts while Convair, Northrop, Grumman and others abandoned their activities along this line.

### Conclusion

The aircraft manufacturing industry anticipates an income of about \$1,250,000,000 for 1948, made up of about 60 to 70 per cent military procurement with strong possibility existing that this figure will climb upward sharply in the middle of the year due to an increase in orders from the services following the filing of recommendations by the President's Air Policy Commission and the Congressional Air Policy Committee.

# NEW Production and Plant EQUIPMENT

For additional information regarding any of these items, please use coupon on page 60

## J-1—New Heald Machines

The new line of 18 internal and surface grinders, and Bore-Matics made by the Heald Machine Co., Worcester 6, Mass., includes the Multi-Way Bore-Matic. Furnished in two sizes, as a Bi-Way, Models 232 or 332, and in two sizes as a Tri-Way, Models 233 and 333, these machines are designed for borizing two or more holes from various directions simultaneously. The combination of "way units" placed as desired, provides for increased production and close accuracy for relative axial location. "Way units" may be operated separately if desired and up to three individual boringheads or a special multi-spindle head unit can be installed on each "way unit."

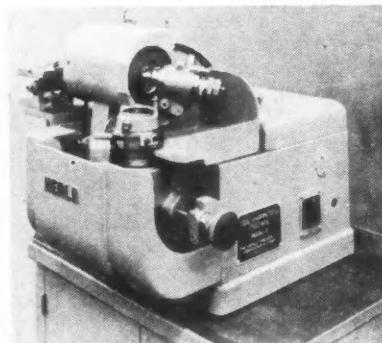
These machines include all the development features of the entire new Heald line. Such details include motor and pump units isolated from base, improved idlers, cylinders, automatic way lubrication and refinements in hydraulics to provide smooth and constant feeds. Like all Heald Bore-Matics, these machines are capable of boring, turning, chamfering, facing, grooving and fly-cutting operations.

Another new machine in the Heald line is the Model 271 Tool Room internal grinding machine. Although specially designed for efficient handling of tool room work, the Model 271 Tool Room machine embodies all the new design features common to the new

Heald line. Structural rigidity, smooth operating hydraulics with constant feeds and speeds, isolation of pump and motor units, improved ring type cylinders with special distortion-free mountings, accessible self-adjusting brakes are a few of these details.

Extremely quick setups are said to be assured with minimum change-over time between jobs for maximum output with easy operation. The machine is readily adaptable to a large variety of parts and range of sizes. The workhead may be accurately swiveled providing a wide angular capacity for taper work; a sine bar attachment may be applied for high precision settings.

Complementing the Bore-Matic line is the Model 2 tool sharpening machine, designed to accurately lap sharp edges to the correct shapes. With this machine accurate adjustment for any desired shape of tool can be made after which the operator has merely to insert the tool in the holder, flick the

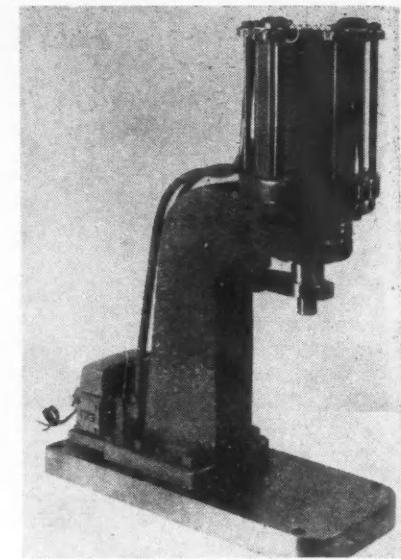


Heald Model 2 tool sharpener

switch and the tool is sharpened automatically. The Model 2 Tool Sharpener can be provided with a coarse wheel for roughing tool surfaces preliminary to finish grinding. Odd shaped tools can be finished on the off-hand grinding attachment using a fine-grit diamond wheel.

## J-2—Arbor Presses

Hannifin Corp., 1101 S. Kilbourn Ave., Chicago, Ill., is now building two new air operated arbor presses, designated as models M-1 and M-2. Both feature a push button controlled elec-



Hannifin M-2 air operated arbor press

tric valve which eliminates manual valve operation and speeds up the operating cycle. Model M-1 is equipped with a 4½ in. dia by 4 in. stroke air cylinder and develops up to 1270 lb ram pressure with 80 psi air line pressure. On Model M-2, the cylinder measures 6½ in. dia by 6 in. and is capable of delivering ram pressures up to 2650 lb. In both presses, the stroke can be varied to meet work requirements.

Both are designed for bench mounting and are quite similar except that the M-2 is built to accommodate larger work. In the M-2, the gap distance from table to ram up is 12½ in.; in the M-1, the gap is 6 in. The M-1 press weighs approximately 210 lb while the M-2 weighs 375 lb. Either press can be supplied without base for special mounting.

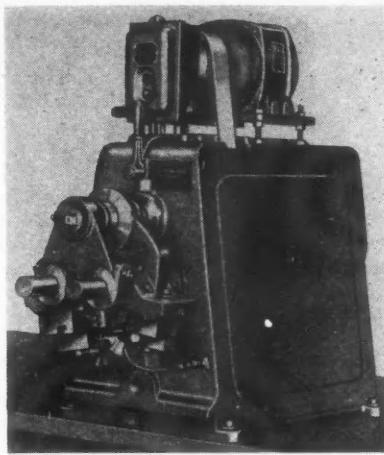
## J-3—Automatic Screw Machine

The Standard automatic screw machine, recently placed on the market by Standard Machinery Co., 1577 Elmwood Ave., Providence, R. I., is said to offer an improvement in the method of driving the feed cam shaft which renders impossible the formation and clogging of long chips. Of value in working any metal or material, this chip-breaking feature is of particular importance in working plastics and other materials which tend to form long, troublesome chips. Twice in each revolution of the spindle, the rotation of the feed cam shaft is interrupted, thereby effecting an intermittent feed which breaks each chip as it is formed. Actually, the motion of the cam shaft does not stop entirely, but rather vibrates harmonically within an amplitude sufficient to break each chip. The tool dwells at the end of its movement while the work is made accurately cylindrical and to a smooth surface finish.

The basic machine, as shown in the



Heald Model 233  
Multi-Way Bore-Matic



Standard automatic screw machine No. 2

illustration, performs two separate forming operations or a roughing cut followed by a finishing tool and a cut off. Special attachments are available for drilling or boring and a ball bearing stock stop incorporating a steady rest feature. The machine can accommodate bar stock up to 1 in. diameter and will perform all normal screw machine operations with the exception of thread cutting on stock up to 1 in. diameter.

#### J-4—Vertical Spindle Grinder

Charles H. Besly and Co., Chicago, Ill., have recently expanded production on a new type 72-in. vertical spindle grinder originally designed for grinding cast iron gear housings. In production runs, gear housings ground on this machine equal or surpass the best work done previously by skilled manual grinding in both finish and flatness (within .003 in.), according to

the manufacturers.

The new grinder, listed as No. 372-72 in., features a power-driven rotary fixture into which the operator places the casting. The rotating fixture and revolving work holders carry the castings through the grinding cycle at one revolution every 60 seconds. Four pieces are ground simultaneously. Approximately 1/32 in. is removed. When smaller castings are ground two or more can be placed in each work holder.

#### J-5—Special Automatic Machine

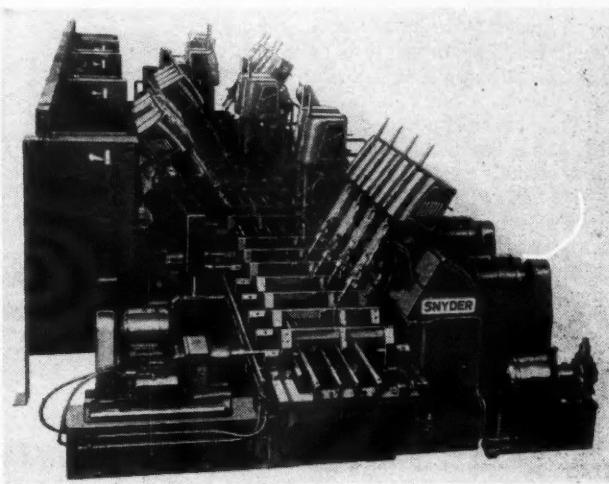
Oil holes in steel crankshafts are drilled at high production rates in a special automatic machine built by Snyder Tool & Engineering Co. Detroit, Mich. The new machine automatically indexes work pieces past a series of

## NEW Production and Plant EQUIPMENT

For additional information regarding any of these items, please use coupon on page 60

holes in the cranks. According to the manufacturer, the machine has increased production on this operation to

Snyder crankshaft drilling machine

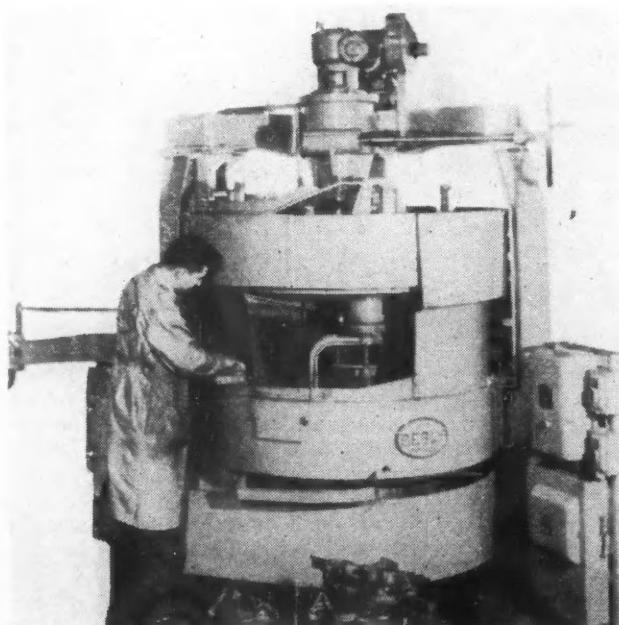


self-contained automatic vertical, horizontal and angular machining units which drill and deep-drill all oil holes and drill and ream two Welch plug

a rate of 60 cranks per hour—(80% of rated efficiency).

Work pieces are loaded at one end of the machine and shuttled through 28 stations by an index bar. At each station, the work pieces are positioned and clamped automatically and drilled or reamed by hydraulically-actuated machining units which operate in an automatic cycle initiated at a central push button station. Twenty-four Avey standard deep-hole units and eight horizontal units are employed. Avey spindles retract automatically when drills are overloaded through excessive chip accumulation or variations in metal hardness. Horizontal units carry multiple heads for drilling leader oil holes in both the stem and the flange end of the crank. Vertical and angular Avey units drill all deep oil holes. High speed drills and reamers are mounted in standard adjustable sleeves. The machine has been designed to provide ample space at all stations for changing tools.

Coolant is supplied from a central system and chips are collected by a chip conveyor travelling the full length of the machine. The machine is approximately 18 ft wide and 39 ft long.



Besly 72-in. vertical spindle grinder

# NEW

Production  
and Plant

## EQUIPMENT

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### J-6—Bending Press With Long Bed

A 500-ton press with an unusually long bed has been added to the Steelweld bending press line of the Cleveland Crane and Engineering Co., Wickliffe, Ohio.

This press, known as a Model Mo6-14, has a 20 ft bed and ram which permits bending steel plate up to 20 ft by  $\frac{3}{8}$  in. or 14 ft by  $\frac{1}{2}$  in. Twenty-one-inch bed extensions on both ends make possible horning operations. To minimize deflection and assure accuracy, the bed extends 42 in. below the floor.

This is a two-speed machine which can be operated at either seven or 20 strokes per minute. It is equipped with tonnage indicators on both ends that show the loading to which the machine is subjected. A clutch knock-out mechanism disengages the clutch when the press is overloaded. The motor-driven back gage is said to be quickly and easily adjusted to proper position.

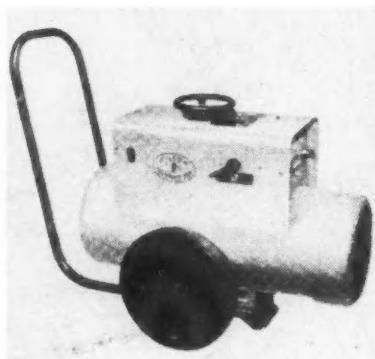
The machine shown is operated by a mechanical foot treadle, but air-electric control can be provided, enabling the use of an electric foot switch which may be slid around the floor in front

of the machine to any position most convenient for the press operator. This type control is especially recommended by the manufacturer for fast production.

### J-7—Arc Welding Machine

The Wilson Welder and Metals Co., Inc., 60 E. 42 St., New York 17, N. Y., has announced the availability of the new Wilson "Hornet" 36A motor generator arc welding machine.

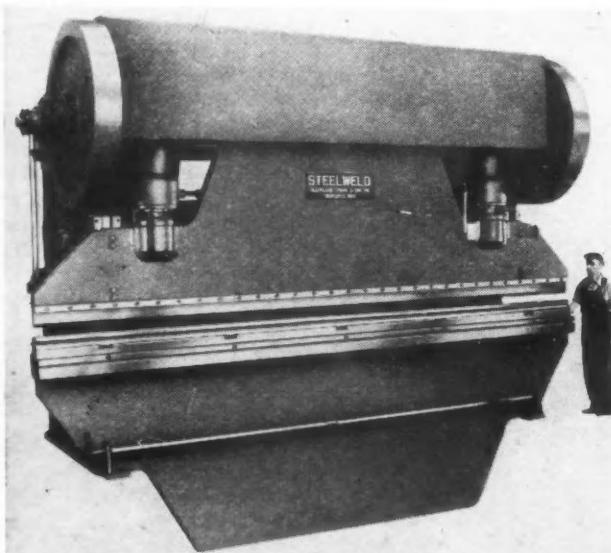
The "Hornet" 36A, of compact design and available in 200-, 300- and 400-amp models, is a heavy duty machine with simple control of current that is said to be easy to adjust and pre-set accurately. It is smaller in size and weighs one-third less than the previous "Hornet" models. This machine is designed for either 220 or 440 volts with no change in relays or ad-



Hornet 36A motor generator arc welding machine

ditional wires being required for voltage reconnection.

The manufacturer states that the heavy duty "Hornet" 36A is designed to furnish a smooth steady current for every industrial welding job under the most adverse conditions, because of its



Model Mo6-14  
Steelweld press

weather resistant, totally enclosed, drip proof construction and special moisture proof insulation.

### J-8—Fork Lift Trucks

Service Caster & Truck Corp.'s Ford-powered Motowlift 1948 fork lift trucks are now in production at the company's plant in Albion, Mich., and Somerville, Mass. All controls and the



Motowlift fork lift truck

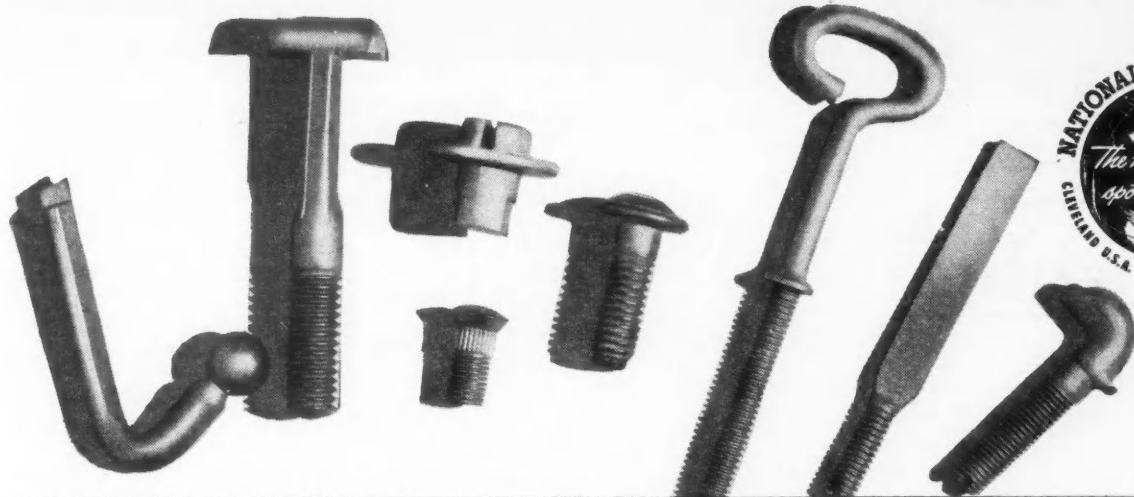
new full-vision instrument cluster on the new trucks are incorporated in the steering column. A single lever at the driver's finger tips controls all hydraulic operations. The design of the seat frame and floor plates provides immediate accessibility for maintenance. Refinements in the 1948 model mast include inclosure of the top mechanism to lessen the drifting of foreign matter into the ram assembly. A specially designed heavy duty transmission and improved steering arrangements are further advancements in the 1948 Motowlift.

The 3000 and 4000 lb solid rubber tired models in 108- and 144-in. lifts are on Service production lines now. A pneumatic-tired model was added to the Motowlift line during December.

Motowlift accessories include a new type of air expanding forks for lifting and transporting concrete blocks, bricks, cases and cartons without the aid of pallets. Scoops, rams, cranes and special forks complete the list of attachments.

### J-9—Fly Cutters And Face Mills

The Kendall Corp., 2359 N. 29 St., Milwaukee 10, Wis., has brought out a new series of "Kendual" fly cutters and face mills made to fit the conventional arbors and the standard American spindle nose drives of milling machines. Hexagon shaped tool bit holders are said to permit easy angular setting of tool bits and provide positive locking means to maintain this setting. Angular setting of the tool bit holder is maintained even when the



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**THE NATIONAL SCREW & MFG. COMPANY, CLEVELAND 4, OHIO**

## NEW

### Production and Plant

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tool bit is removed for grinding. Positive clamping of tool bit in tool bit holder is by means of a tapered spacer, clamping wedge and clamp screw so located in the cutter body that it re-



Kendual face mill

ceives no shearing stress. Cutter body is of heat-treated steel. Each of the separate tool bits may be ground and individually positioned to do a portion of the job, thus combining in a single operation, a number of complicated cuts.

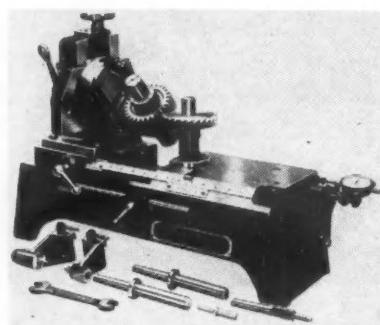
### J-10—Tube Mill

American Electric Fusion Corp., 2600 Diversey Ave., Chicago 47, Ill., has developed a mill for converting strip into standard weight pipe with diameter sizes ranging from  $\frac{1}{2}$  in. to 2 in., inclusive. The mill transforms coils of flat strip into electrically welded pipe at speeds up to 65 fpm, depending on diameter. The pipe is formed, welded, scarfed, sized, straightened and cut

to length in one continuous automatic operation. The manufacturer states that the finished pipe possesses the same strength and qualities as the original strip from which it is formed, and the welded seam has a greater strength than the parent metal. The mill will produce pipe from  $\frac{1}{2}$  in. to 2 in., inclusive, to meet all required pressure tests, and in accordance with all specifications for electrically welded American standard weight pipe.

### J-11—Improved Gear Tester

The Parkson gear tester distributed by the George Scherr Co., 200 Lafayette St., New York 12, N. Y., has been completely redesigned. The new ma-



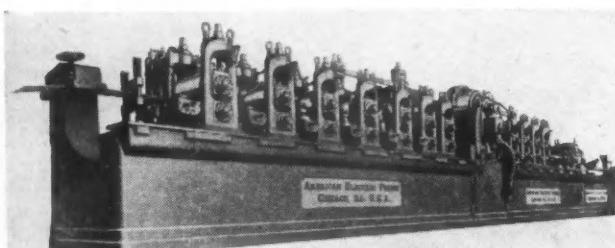
Parkson gear tester

chine now incorporates an adjustable stop rod. This stop rod is in addition to the precision scale and long vernier which are used for the setting of the center distance. However, when a number of gears of the same size are to be tested, it is no longer necessary to repeat the scale setting. Instead, the stop-rod is set and clamped in position. To change the set-up, the left-hand slide is moved out of the way; the gears on the arbor are replaced and the slide is then brought back into the same position against the stop.

The illustration shows a machine set up for spiral gears, but it is also available for spur, bevel, and worm gears, either in combination or single purpose models.

### J-12—Line of A-C Welders

A line of A-C welders has been developed by the John A. Kern Co., 212 N. Loomis St., Chicago 7, Ill. The line includes three industrial models—200, 300 and 400 amp, and two models for



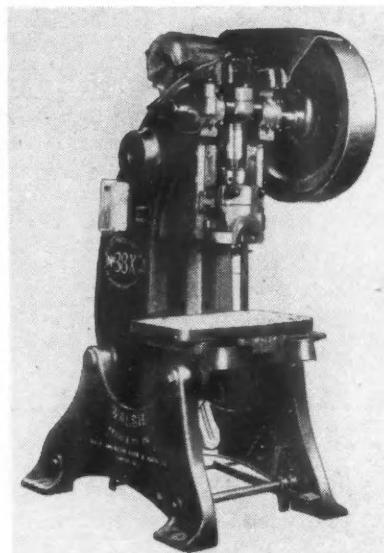
Mill for converting strip into standard weight pipe

farm and general shop use—130 and 180 amp.

Features of all models, claimed by the manufacturer, are: Electrical and magnetic circuits which result in instant starting, smooth and stable arc at all amperage settings. The design also produces high power factor, reduces "no-load" losses and results in high efficiency. Compactness is due to the fact that the movable core on all models travels less than one in. to cover the entire range of stepless amperage control. The arrangement of dual primary and secondary coils and the elimination of arc boosters, reactor coils and fans also contributes to the compact design. The absence of rotary parts results in quiet operation and virtually eliminates the need for lubrication and maintenance. Efficient cooling is brought about by providing ample air passages around coils and cores. The air intake at the bottom of the housing is more than a foot above the floor.

### J-13—Inclinable Punch Press

A 38-ton capacity, open back, inclinable punch press has just been added to the line manufactured by the Walsh Press and Die Co., Division of American Gage and Machine Co., 4709 W. Kinzie St., Chicago 44, Ill. Equipped



Walsh punch press

with a variable speed drive, this Model 38X serves as a tool-room and test-run press or as a production press.

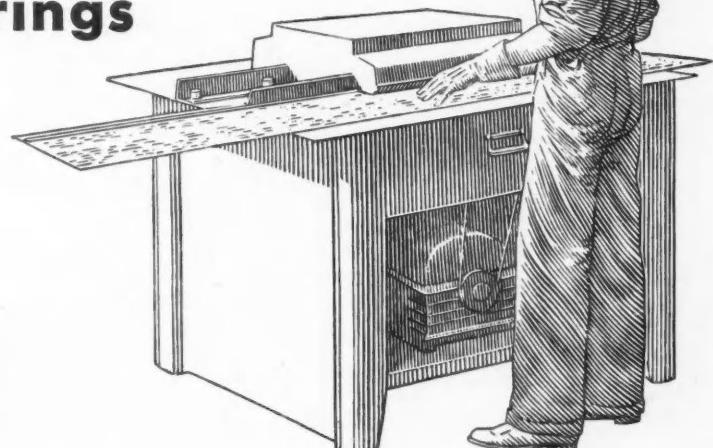
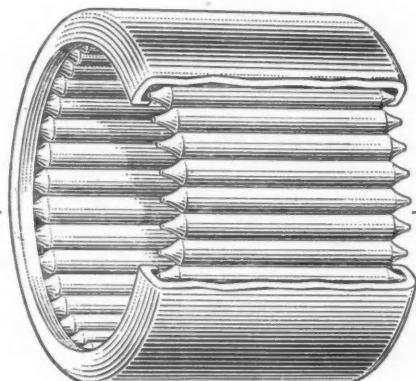
In the tool room the press can be used for shearing-in of dies and punches, and for die try-outs. Used for die try-outs in place of a screw press, the Walsh 38X will give an exact indication of results on the production run.

The large shut height and bolster plate area make this press adaptable to certain notching, forming and die-casting trimming operations where plenty of room is required.

## Power Requirements

Cut 50% by Torrington

### Needle Bearings



...another advantage of these compact anti-friction units is capacity to carry high radial loads imposed on forming rolls of the Lockformer.

BY CHANGING to Torrington Needle Bearings on gear trains and forming rolls, the Lockformer Company cut the power consumption 50% in all models. *No major design changes were required* in adapting these compact anti-friction units to the limited space available. Simple housing design and easy installation by one arbor press operation keep fabrication and assembly costs low.

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# TORRINGTON BEARINGS

In one pass, Lockformer sheet metal machines form flanges ordinarily requiring many brake operations. Needle Bearings on gear trains and forming rolls greatly reduce power requirements and increase service life.

## NEW



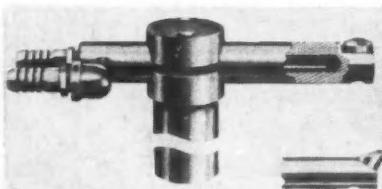
## PRODUCTS

For additional information regarding any of these items, please use coupon on page 60

### K-1—Light Duty Electrode Holder

Announcement is made by P. R. Mallory & Co., Inc., of a specially designed water-cooled, light-duty holder for resistance welding electrodes.

The new holder was designed for hard-to-reach spot welds. It incorporates a button type, replaceable electrode held in place by an easily removed Allen head screw. Water cooling is brought as near the electrode as possible to insure maximum electrode



Mallory electrode holder

life under the most severe usage. Almost 4 in. of offset adjustment is available by setting the minimum amount of offset desired and setting two Allen head bolts in the "T" connection head. Shank length is 3 in. with diameters of  $\frac{3}{8}$  in.,  $\frac{5}{8}$  in., 1 in.,  $1\frac{1}{4}$  in. The complete holder with the exception of Allen head bolts and water connections is made from Mallory 3 metal bar stock, said to possess the highest electrical and physical properties.

### K-2—High Density Alloy

Introduction of G-E Hevimet, an alloy of tungsten, copper and nickel, to General Electric's line of metallurgical products is announced by the Metallurgy Division of the Company's Chemical Department at Pittsfield, Mass. The alloy possesses a density 50 per cent greater than lead and is applicable to the design and construction of moving parts possessing maximum inertia and minimum size.

Originally developed in response to demands for a material of high den-

sity for use on a gamma ray screen, Hevimet is adaptable to the construction of balance weights for the elimination of vibration in crankshafts, modern air screws, centrifugal clutches and other rotating parts. Combining great tensile strength with good machinability, G-E Hevimet is said to be highly resistant to atmospheric salt water corrosion and easily plated with cadmium, chromium and nickel. It can be silver soldered and brazed by standard methods.

A sintered material, Hevimet is made in a variety of non-porous sheets and blocks. Complex shapes may be built up from simple pressing by a special process of hydrogen welding. The average product has a density from 16.8 to 17 grams per cu cm, a tensile strength of 85,000 to 118,000 psi, a Rockwell hardness of 30 to 40 "C" scale.

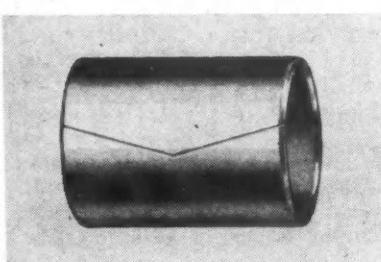
### K-3—Cutting Electrode

Eutectic Welding Alloys Corp., New York 13, N. Y., is introducing a new arc-vapor cutting tool. Known as CutTrode, it consists of a metallic core, surrounded by a specifically designed sheath or coating which is extraordinarily resistant to heat at very high current ranges. This coating serves to focus and intensify the energy of the electric arc, which is generated when CutTrode is "struck like a match" against a piece of steel or any other metal and then actually pushed through that metal as readily as a pencil through a pat of butter, according to Eutectic.

This new tool, in rod form, is said to be quite inexpensive. It can be used with almost any standard arc-welding machine.

### K-4—Improved Bushings

National Formetal Co., Inc., Cleveland, Ohio, has added two improvements to its "Tite-Seam" bushings and bearings. These bushings are now made from a new special bronze developed by National Formetal and known as "Easy-Ream" bronze. This



Easy-Ream bronze bushing

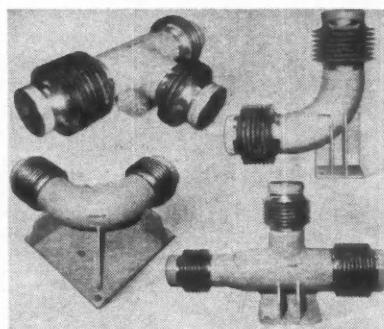
material is said to ream readily and still continue to provide all the other qualities of the "Tite-Seam" bushing such as uniformity of structure, high physical properties and long lasting performance.

A new envelope seam replaces the

conventional straight seam. It lends itself to easy installation and at the same time eliminates difficulties formerly encountered when straight fluted reamers were used.

### K-5—Anchor Base Expansion Joints

A new line of anchor base expansion joint pipe fittings has been added to the six standard series of packless expansion joints made by MagniLastic, a division of Cook Electric Co., Chicago, Ill. Four typical units are illustrated, all of stainless steel. In the side "T", the number of bellows flanges may be



Anchor base expansion joint pipe fittings made by MagniLastic

varied to accommodate unequal expansion in each leg. Each of these particular fittings stems from the standard MagniLastic 400-lb series and was constructed for steam lines.

Complete expansion fittings are said to solve many piping layout problems of limited space and multi-expansions. Pipes need only be led to the fitting point and joined to proper unit, which is complete with anchoring base.

### K-6—High Strength Aluminum Alloy

A new aluminum casting alloy, called Tenzaloy, has been brought out by Federated Metals Division, American Smelting and Refining Co., New York 5, N. Y.

Tenzaloy, an aluminum-zinc alloy, is being produced by Federated in response to foundry demand for a casting alloy that furnishes high strength and hardness without the expense of heat treatment. The maker states that foundries without heat treating equipment can now produce castings having properties equivalent to those obtainable by conventional heat treating methods.

Nominal composition of Tenzaloy is 0.8 per cent copper, 0.4 per cent magnesium, 8.0 per cent zinc, and balance aluminum.

Other advantages of Tenzaloy, according to the manufacturer, are exceptional machinability, excellent corrosion resistance, and extreme whiteness. The extreme toughness of the alloy has permitted it to replace mal-

# **VICKERS** Variable Speed HYDRAULIC TRANSMISSION 1/2 Horsepower



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**\$75.00**

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Here is a compact, sturdy, variable speed hydraulic transmission for machinery drive. Any speed from zero to 1750 rpm—in either direction can be obtained without reversing the driving motor.

Effortless finger tip speed adjustment over the entire range is obtained by the handwheel control and the selected speed remains constant. A hydraulic servo control mechanism is also available. The full output torque is available throughout the speed range and the built-in automatic overload protection permits stalling without causing damage.

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1921

## NEW



## PRODUCTS

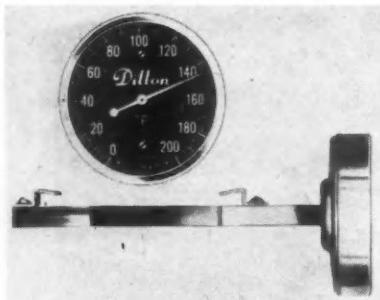
For additional information regarding any of these items, please use coupon on page 60

leable iron in a number of applications. Products such as hose couplings, "C" clamps, electrical conduit fittings, and general hardware fittings are being made with this alloy.

Tenzaloy is readily cast with standard foundry procedure and equipment into sand, plaster, or permanent molds.

### K-7—Flat Stem Dial Type Thermometer

The Dillon flat stem, dial type thermometer, offered by W. C. Dillon & Co., Chicago 44, Ill., has been designed to clamp onto flat surfaces such as power bus bars, switch blades, engine blocks, water jackets, etc. With this flat stem design, the heat element goes down snugly



Dillon thermometer

against the object under test and presents a wide heat-absorbing area.

This new thermometer can be supplied in flat stems of varying widths, thicknesses, and lengths. These stems are available in a wide range of metals, and the following capacities are standard: 0-200 F, 50-500 F, 150-750 F, and 200-1000 F. 3 in. and 5 in. dials are also standard, and Centigrade ranges are available on order.

### K-8—Smoke Indicator

Photoswitch excess-smoke indicator Type 2A10C, a recent development of Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass., gives a continuous indication to the boiler room of the

condition of the gases which are passing through the flue, signalling when either smoke or air are sufficiently excessive to cause inefficient combustion or create a smoke nuisance. Photoswitch excess-smoke equipment includes photo-electric control Type 2A10C, light source Type L30R, and densometer Type D33. The photoelectric control and light source are mounted on opposite sides of the flue or breaching. The light beam from the light source projects through a small opening in the flue to the eye of the control.

Control Type 2A10C consists of a single phototube operating a dual re-



Photoswitch excess-smoke indicator Type 2A10C

lay system. This indicates combustion conditions on Densometer D33 which is located on the boiler room instrument panel board. A sensitivity adjustment on the photoelectric control is set upon installation to compensate for flue dimensions and other variables. As soon as this adjustment has been made, the densometer indicates and signals excess air, excess smoke, and efficient combustion at established Ringelmann values.

### K-9—Electrode for Surfacing Dies

The Lincoln Electric Co., Cleveland, Ohio, has developed a new electrode, Toolweld A & O, for hard surfacing tools and dies. The new electrode is designed to simplify procedures and reduce the cost of depositing surfaces of weld metal of tool steel quality.

Toolweld A & O ("A" for air-quench; "O" for oil-quench) is for use in building up the working surfaces or edges of cold-working metal-cutting and forming tools. It will produce surfaces of high strength for resisting wear and impact in all applications where high temperatures are not encountered. When deposited on either ordinary carbon steel or on any one of the hundreds of alloy steels, Toolweld A & O produces a surface whose properties will match those of the best tool and die steels, according to the manufacturer.

The deposited weld metal is of the

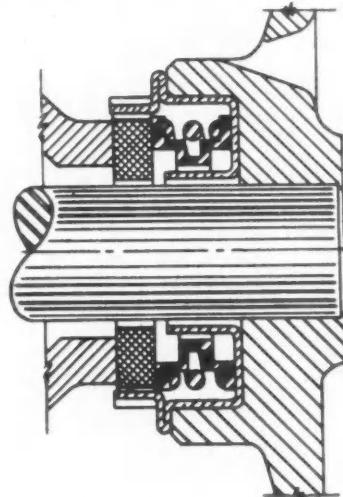
5 per cent chrome type and may either be used as welded or subjected to a wide range of heat treatments. When used on ordinary steel, the weldment may be heat treated to give the maximum hardness quality in the weld. When used on tool steel, the weldment may be heat treated as is demanded by the nature of the base material.

Toolweld A & O is a versatile electrode for the manufacture of composite metal-working tools by using a carbon steel base and building up edges of tool steel quality, or for the alteration or repair of hardened dies and tools. Applications can be made on such tools as blanking dies, forming dies, die-casting dies, upsetter dies and punches, forming rolls, burnishing tools, centerless grinder rests, planer ways, flash shearing dies and punches.

The electrode will operate on either alternating or direct current, electrode negative with direct current. It will deposit a thick bead in one pass in the low current portion of the operating range, and a thin bead in the high current portion of the range.

### K-10—Water Pump Seal

Brummer Manufacturing Co., 1324 S. McKinley St., Chicago Heights, Ill., is manufacturing a new water pump seal. To facilitate handling as a single unit instead of loose or separately shipped parts, the spring chucks concentrically over the synthetic reel shaped boot. To complete the unit, boot flanges are cemented into the



Cut-away view of Brummer water pump seal

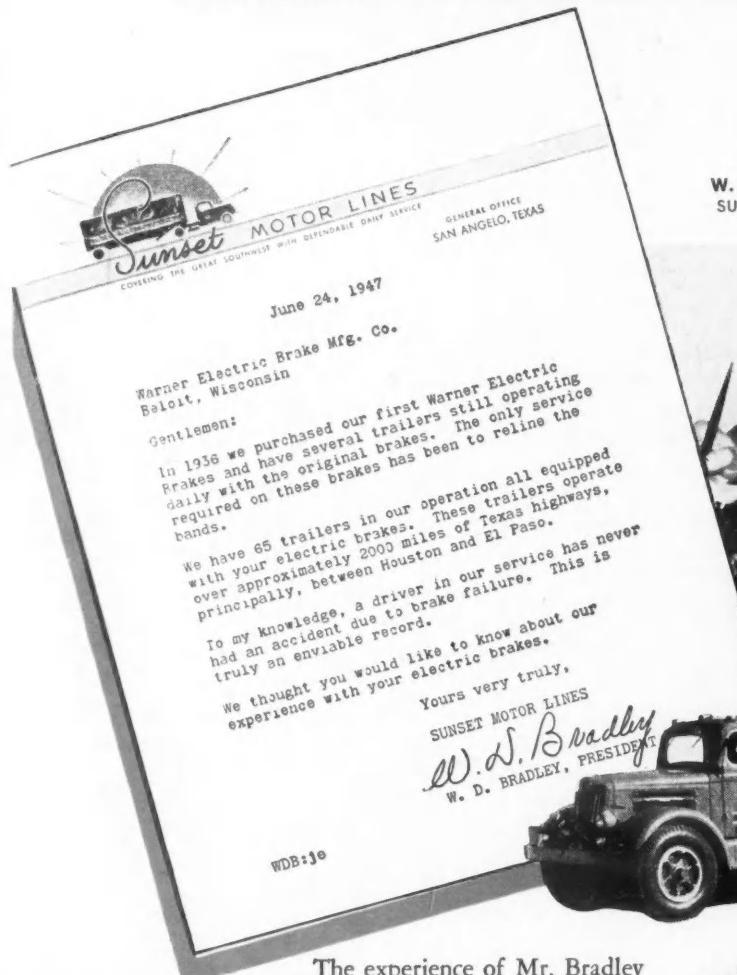
cartridge cup and onto the thrust washer.

This assembled unit is installed by simply pressing the cartridge to seat on its flange, into a specified diameter cavity.

In addition to the water pump seal, Brummer also makes an improved rear main bearing seal produced by bonding hardened steel and fabric parts within a precise single-circular length of oil-resistant synthetic rubber.

# USER REPORT

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SUNSET MOTOR LINES



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BELOIT, WISCONSIN



# Aluminum Stretches Steel Supply for Cars

(Continued from page 29)

R. H. McCarroll, Ford executive engineer, states that in general the cost balances off with steel—a little higher here, a little lower there.

Aluminum in running boards, for example, results in some cost saving because it eliminates the rust-proofing and rubberizing processes. Another advantage is that the saving in weight is substantial, the actual weight of each finished running board being 4.3 lb as against 19.2 lb for the steel part. In the case of headlamp housing the weight saving is only about 2 lb, but the use of aluminum is profitable because it eliminates the need for plating to prevent corrosion. The total weight now being saved is 65 lb per car.

McCarroll says that many of the present, probable and possible aluminum substitute parts may be dropped when steel becomes plentiful, but also many others are here to stay because of proven superiority cost-wise and service-wise. He explains that the cost factor makes it impractical to make body panels of aluminum at this time because in sheet metal, steel has a three-to-one ratio over the lighter metal in strength. This ratio makes aluminum panels cost more and at the same time eliminates aluminum's weight advantage.

The Lincoln Division of the Ford Motor Co. is using approximately the same amount of aluminum now as prewar in its standard models, but a great deal more in its luxurious Continental line. Here aluminum has replaced steel in eight places—windshield frames, window moldings, tail light assemblies and body and floor braces. A Lincoln official says that sometimes malleable iron is substituted for aluminum, when the former is in greater supply, but that otherwise aluminum is used where it reduces fabrication costs and eliminates finishing processes.

## Kaiser-Frazer Gasoline Tank

The industry is watching with much interest an experiment with aluminum gasoline tanks at Kaiser-Frazer. Engineers admit that stamping a modern oblong steel tank is one of the most difficult fabricating jobs because of the sharp draw required to shape the edges. K-F engineers have developed a process to make tanks of aluminum which they claim will be lighter and stiffer than the standard 21 gal steel tank. The K-F aluminum tank of the same capacity, production

of which is to start in February, saves 15 lb in weight. Initial fabricating costs will be expensive because new machines and techniques are required, but the designers believe that eventually its cost will be comparable with that of the steel tank. Meanwhile the overall weight of the car has been reduced 15 lb and there is saved 22 lb per car of that hard-to-get steel for other uses. During the two-year history of the K-F company its engineers have been experimenting with aluminum for other car applications.

## Extensive Chrysler and GM Research

Chrysler Corp. has extensive research in progress on further application with aluminum. The experiments are being conducted in behalf of the entire Chrysler line—Plymouth, Dodge, De Soto and Chrysler. As yet no application has been made to any noteworthy extent in postwar models beyond prewar uses. Chrysler development work is being concentrated on lighter trunk lids, hoods and cowls. A corporation spokesman says company engineers have shelved experiments on the use of aluminum sheets for bodies, having concluded that aluminum panels are more expensive and less durable than steel.

General Motors divisions are aluminum-minded and have considerable experimental work under way to develop more uses for the lighter metals. None of the GM "New-from-the-Wheels-Up" cars have been introduced as yet, but indications point to the substitution of aluminum for steel where feasible. The hydraulic torque converter unit of Buick's new automatic transmission is reported to contain a great deal of aluminum which improves its operation. Oldsmobile, Chevrolet, Pontiac and Cadillac are retaining prewar aluminum parts and are investigating other possibilities for new models, but company spokesmen refrain from giving any details at this time.

Packard and Hudson, which have announced their 1948 models, have introduced two new uses for the metal. Packard found that aluminum is ideal for its new perforated heater chamber which collects and distributes warm air under the dash. Because it is more adaptable and available, Packard is producing the chamber and ducts leading to it of aluminum. Similarly, Hudson engineers decided on aluminum for the intake manifold of the new Hudson engine. Before the war Crosley

did not use aluminum in its cars, but now are making oil pump body, oil pump cover, radiator inlet connection, water pump body, flywheel housing and engine crankcase of it.

## Possible Aluminum Parts

If the current trend toward aluminum continues, numerous other parts made of it may soon appear, such as air cleaner, heater housings, headlamp adjusting rings, headlamp reflectors, hub caps, name plates, floor pan sections, glove compartment doors, instrument housings, accelerator pedals, door handles, exhaust manifolds, muffler parts, and others in addition to those already mentioned. Bumpers are another possibility, but some way must be found to plate them on a more economical basis.

On the other hand, some companies are not showing much enthusiasm for aluminum. Nash is sticking to steel by relying on design to maintain low weight and Studebaker recently purchased a sizable steel mill to safeguard its steel supplies. S. W. Sparrow, director of research at Studebaker, states that they are continually investigating new possibilities, but thus far have found few places in an automobile where aluminum can be considered a practical substitute for steel, but that if aluminum costs were competitive with steel, the situation would be entirely different. Studebaker's engines are equipped with aluminum pistons.

Walter F. Benning, Willys-Overland executive engineer, says the company has no intention of using additional aluminum in 1948 because in most cases it is not available. It is apparent that if the swing to aluminum generates too great a demand, the supply problem will become the same as with steel. Willys-Overland engineers have been engaged in intensive investigations and experimental work, but have found that weight savings were not as great as first believed. Transmission cases and similar parts are more expensive in aluminum, one reason being that cast iron inserts must be cast into the housing to provide secure bearing supports and cap screws must be replaced by studs. Willys-Overland finds that not more than half the weight can be saved by this conversion and at a considerable premium in cost.

A new accessory for the Jeep is an all-aluminum top which is being manufactured by the Lifetime Stoker Co. at Pemberville, Ohio. Production is expected soon to reach 750 to 1000 a week, the rate being determined by the availability of aluminum. Over 3000 tops have been made to date. The aluminum top, which is of welded construction and equipped with Plexiglas windows and two wide doors, weighs about 30 lb and is bolted to the Jeep body. Laurel C. Worman, Inc., of Toledo, is handling the distribution in the United States and foreign distribution is through the Willys-Overland Export Corp.

# "FASTER four ways,"

says

The Rudolph Wurlitzer Co.



Extracts from another of the series of independent surveys by James O. Peck Co., of assembly savings made with Phillips in leading plants.

"We specify Phillips Screws for our coin-operated phonographs," said Wurlitzer's engineering staff, "because they're faster four important ways.

**"Start quicker, drive faster.** Although we haven't made actual time studies, it's fairly easy to see how much shorter assembly time is with Phillips Screws. That's natural . . . the perfect fit of the driving bit in the Phillips Recess makes locating the screw and driving it much more positive.

**"Tricky assemblies simplified.** The firm seat of the driver in the Phillips Recess speeds up otherwise slow jobs such as blind driv-



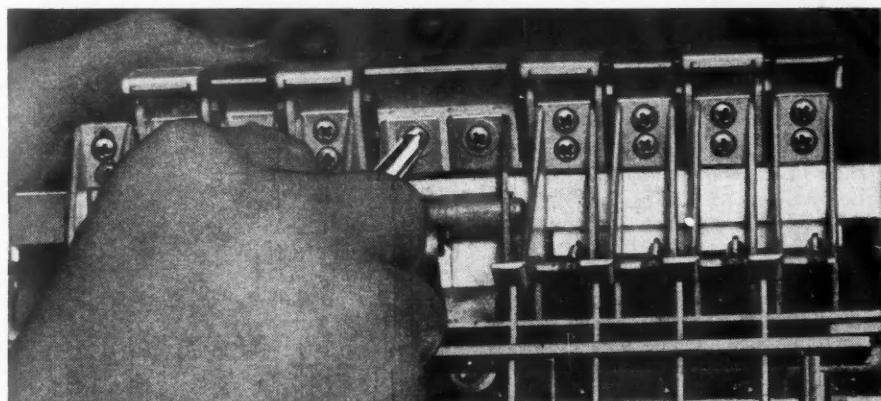
One screw driver slip at this point in the assembly and an expensive, highly polished piece of Plexiglas would be ruined; and worse still, a half hour of assembly time irretrievably lost. Wurlitzer uses Phillips Screws and avoids slips.

ing, sensitive adjustments, spring assemblies, and driving with jigs.

**"No mental hazards . . . steadier work.** Inside and out, there are a lot of places where a skidding

screw driver would do a vast amount of harm to these machines. Since that danger is non-existent with Phillips Screws, our assemblers make better time, work more smoothly.

**"New help learns faster.** Even people who have never driven screws in factory production can be trained to drive Phillips Screws much easier and faster than they could be taught to drive slotted screws. Also eliminated is the danger to hands and arms from jagged, burred heads turned up so frequently on slotted screws. And far fewer screws are dropped on the floor . . . a not inconsiderable saving to us."



Adjusting the selector keys. The absolute seat of the driver bit in the Phillips Recess lets the assembler concentrate all her attention on the adjustment.

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## PUBLICATIONS AVAILABLE

Publications listed in this department are obtainable by subscribers through the Editorial Department of AUTOMOTIVE INDUSTRIES. In making requests please be sure to give the NUMBER of the item concerning the publication desired, your name and address, company connection and title.

### H-1—Plain Hydraulic Grinder

Landis Tool Co.—A 4-page folder, Bulletin CB-47, illustrates and describes the 6 in. Type CH Plain Hydraulic Grinder. Four special features are described and illustrated, optional features and special tooling, standard equipment, and a table of condensed specifications are included in the bulletin.

### H-2—Power Presses

E. W. Bliss Co.—A new folder, New Pages in the Bliss Book of Advanced Press Design, illustrates and describes the company's new presses, including a Briquetting press, Triple Action Toggle press, Single-Crank Toggle press and a new Metal Spinning Lathe.

### H-3—Horses to Horsepower

Automobile Manufacturers Association—The influence of motor trucks on daily living in the United States is told in a new illustrated booklet, Horses to Horsepower. It presents a segment of history-in-the-making, showing the

revolutionary changes in the average American's living which have resulted from the phenomenal increase of truck transport in the years after World War I. Other brief chapters on trucks tell a story which the public seldom sees and gives recent and unusual uses of trucks and trailers.

### H-4—Tenzaloy Aluminum Alloy

American Smelting & Refining Co., Federated Metals Div.—A 2-color folder describing the properties, composition and characteristics of a new aluminum casting alloy, Tenzaloy, contains graphs which visualize the metal's properties and specific tables of technical data.

### H-5—High Speed Midget Mills

Severance Tool Industries, Inc.—12-page Bulletin 16-M is a handy reference for the products of the Midget Mill Group, the Junior Mills, Lab Mills, Carbide Midget Mills, Die Mills, Micro-Mills, etc. Listed also are the Severance Ground Carbide Hand Files and Ground Carbide Die Machine Files. Various patterns of cut, tooth charac-

teristics and pitches of teeth, regrinding service and the latest description and listing on the new Micro-Mills are included.

### H-6—Hydraulic Oils

E. F. Houghton & Co.—Handbook on Hydraulic Oils, a new 48-page book, is a practical, easy-to-read reference for users of hydraulic oils. The seven chapters cover many tables, diagrams and illustrations and specifications, importance of properties not included in the usual specifications, additives and qualities a good hydraulic oil must possess. A chapter on trouble shooting is devoted largely to listing specific troubles and their remedies.

### H-7—Axial Air Gap Motor

Fairbanks, Morse & Co.—Bulletin 2760, an attractive, 16-page booklet, describes the design and characteristics of Fairbanks-Morse Axial Air Gap Motor, for machine application. Chapters are devoted to versatility in application; features of construction; dimensions; single phase motors, etc.

### H-8—Welding Problems

Eutetic Welding Alloys Corp.—A new bulletin, Arc Welding Problems Successfully Solved, covers welding cast-iron, low and high alloy steels, stainless steel and tool steels to high carbon steels, etc. Several production case histories are presented. The bulletin is illustrated.

(Turn to page 67, please)

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# AUTOMOTIVE INDUSTRIES

## 30th ANNUAL STATISTICAL ISSUE

to be published  
March 15, 1948



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## Dodge Trucks

(Continued from page 35)

ing to vision and safety. Drivers are able to see in all directions.

Noteworthy from the standpoint of the operator is the fact that all conventional models can be road-serviced from the left side—the fuel tank, oil filler, radiator filler, and battery being located on the left.

In view of the great variety of conventional and COE models offered in the line, complete specifications cannot be given. However, a comparison table

of new and old models showing GVW and GTW ratings and wheelbase is shown in the accompanying table. It is of special interest to note that Dodge has seven different engines to handle the power requirements of its varied line. The four-wheel-drive Power-Wagon remains substantially the same as before, both in styling and mechanical specifications. The new line has larger and improved braking systems; front and rear axles of increased load-carrying capacity; longer front springs, and increased treads.

Engines for models of 1½ ton and upward are rubber mounted at the front to reduce noise and vibration. A

thermostatic manifold heat control valve has been added on models from ½ ton to 2 ton, inclusive, to control the temperature of intake manifold gases. The ignition coil is mounted on the engine to reduce interference with radio reception. Distributors of moisture-proof design with built-in resistors prevent moisture shorts, improve performance and serve as a further aid in suppressing high frequency interference. The generator voltage regulator is effectively sealed against dust.

Engines for the 2½- and 3-ton high tonnage models are fitted with sodium-cooled stellite-faced exhaust valves and stellite-faced exhaust valve seats, with intake valve seat inserts of hard heat-withstanding alloy. Two-ton engines also feature sodium-cooled stellite-faced exhaust valves. Engines for the other models have exhaust valve inserts of a hard heat-withstanding alloy. Among the features on all models is the adoption of a new type magnetic fuel gage.

Batteries for all conventional cab models are mounted outside the left side rail in the air stream for better cooling and longer life. They are easily accessible for service through an opening in the cab floor. Capacity of batteries for models rated ½ ton through 2-ton has been increased. The battery in COE models is mounted directly under the hood where it is readily accessible.

Radiator cores are lower and wider to facilitate better cooling. Frontal area of the ½- to 2-ton models is increased. The fan shroud and pressure type radiator cap are continued on the 2½ and 3-ton models.

Although transmissions remain substantially the same as before, the shift lever tower and hand brake lever on all models are moved forward to the front edge of the floor board to afford maximum clearance between the controls and the seat. At the same time, the gear shift lever has been reshaped to give clear floor space from door to door. This permits the driver to enter or leave the cab from either side, a saving in time, which often provides safety. A new synchronizer has been added to the one-ton transmission to facilitate shifting.

The clutch installation remains the same as before, with oversize units as optional equipment offered on the ½ through 1½-ton models. Front axle capacities are upped on 1½-ton through 3-ton models, by use of redesigned I-beams with larger sections. Treads are increased to effect a smaller turning radius. Tie rods and drag links are improved to provide better sealing around the ball studs, with a rubber seal replacing the leather seal used formerly. A solid rod drag link is used on models of ½ through 1-ton capacity.

Load-carrying capacity of rear axles on ½ through 2-ton models has been increased. The rear axle for the ½ and ¾-ton models has a one-piece tubular housing with the wheel bearing seal against the shaft instead of the hub (which was former practice). The

(Turn to page 64, please)



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## Dodge Trucks

(Continued from page 62)

diameter of the housing for 2-ton models has been increased from four in. to 4½ in. at the spring seat to increase strength. In the interest of reducing unsprung weight, the 2-ton B-1-KA and B-1-KMA two-speed axle now has a one-piece tubular housing.

The vacuum booster is optional on the 1½-ton B-1-F, B-1-FA, B-1-FM, B-1-FMA models. It is standard on the 1½-ton B-1-H, B-1-HA, B-1-HM, and B-1-HMA, all 2-ton, 2½-ton and

3-ton models. In addition, air brakes are available as optional equipment on the 2½ and 3-ton models. The two-piece propeller shaft drive with an intermediate rubber insulated center bearing mounting has been adopted for all 1½, 2, 2½ and 3-ton chassis; the propeller shaft set-up on other models remaining the same save for length.

Some exceptional improvements have been made in frame construction. On the 2-ton 128-in. wheelbase conventional and 107-in. COE models, which are used for tractor service, the full depth of side rails is carried over the rear axle to within a short distance from the end of the rail where it tapers from the

top of the rail. This taper provides clearance when coupling the tractor to the trailer. This improvement previously was incorporated on models of the 2½-ton and 3-ton line. Frame side rail sections on 2½ and 3-ton models are increased. Frame side rail reinforcements are supplied as standard equipment on some models and as extra equipment on all others from the 1½ through the 3-ton.

Front springs for ½ ton through 2-ton are longer to provide a softer ride, and capacities are increased to handle the heavier loading. All front springs are shackled at the rear with the spring taking shock loads in tension rather than compression. Hydraulic double-acting shock absorbers are standard equipment on some models and are offered as extra equipment on all other models. Full wide base rims are used on all 20-in. wheels to provide better tire life.

To provide a quiet ride and to maintain cab alignment, the cab is mounted at four points on rubber insulators. The front insulator on the steering gear side is of hard rubber to maintain steering gear alignment. All cabs are thoroughly insulated for effective sound- and weather-proofing. Cabs are of all-steel welded construction, cabs, fenders, and sheet metal being effectively rust-proofed against water and weather.

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## Buick's Metal Plant

(Continued from page 41)

stallation lies in the fact that there is no visible activity. The ovens are completely automatic in their function, precisely controlled as to temperature and time cycles. Since the entry and egress of conveyors with their work load takes place through openings in the floor of the ovens, they are completely sealed externally and appear to be entirely static to the observer.

Upon completion of surfacer drying the two conveyors lead downward again, this time carrying the work to the hood and fender merry-go-round lines that constitute the water deck. Here they are wet sanded, carefully inspected, and spot-surfaced if need be. This is the final operation on hoods and fenders. They are re-hung on their respective conveyors for transport to the paint department in the assembly building. It is of interest to note that the four merry-go-round conveyors mentioned here are about 116 ft in length and carry 23 fixtures each.

Parts intended for Buick-Oldsmobile-Pontiac assembly plants are neither surfaced nor Bonderized. After the initial preparatory stages of welding and metal finishing on the merry-go-round, they are hung on the BOP float conveyor which serves to store them until ready for shipment. To protect the metal while in storage and in transit, the parts are given a coating of a light rust-proofing oil.

## Publications

(Continued from page 60)

### H-9—Automatic Self-Priming Pumps

Allis-Chalmers—A new 8-page illustrated bulletin describes and illustrates the company's automatic, self-priming pump, equipped with a new type automatic spring valve.

### H-10—Arc Welders

The Hobart Bros. Co.—36-page, 3-color catalog containing illustrations, descriptions, dimensions and specifications on its complete line of Simplified arc welders. Various features comprising the machines are individually illustrated and described and helpful information is given for various welding problems. A list of the complete line of Hobart arc welding electrodes and accessories is included.

### H-11—Centering Machines

The Whiton Machine Co.—A new 4-page 2-color folder featuring the Whiton Centering Machine has been issued. It contains illustrations of the newest designs in centering machines and devotes space to engineering information in concise, easy-to-read form.

### H-12—Rotary Files

The Charles L. Jarvis Co.—A new 2-color, 12-page catalog illustrates a complete line of high speed and tungsten carbide rotary files and pictures in detail many more files in the Jarvis line. The files are illustrated in actual size.

## CALENDAR

### Conventions and Meetings

Natl. Motor Boat Show, New York City	Jan. 9-17
Soc. of Automotive Engineers Annual Mtg., Detroit	Jan. 12-16
Natl. Materials Handling Exposition, Cleveland	Jan. 12-16
Natl. Auto Dealers Assoc. Exhibition, Chicago	Jan. 25-29
Institute of the Aeronautical Sciences—Annual Mtg., New York	Jan. 26-29
International Sports, Travel and Boat Show, Chicago	Feb. 27-Mar. 7
Tool Engineers Industrial Exposition, Cleveland	Mar. 15-19
Chicago Production Show, Chicago	Mar. 22-24
The Inst. of the Aeronautical Sciences Natl. Flight Propulsion Mtg., Cleveland	Mar. 26
Natl. Assoc. of Corrosion Engineers Mtg., St. Louis	Apr. 5-8
Southern Mch. & Metals Exposition, Atlanta	April 5-8
32nd International 500-Mile Race, Indianapolis	May 31

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**CRITICAL ACCURACY**  
*you build into your machines*  
**EASY TO MAINTAIN**



MOST EQUIPMENT MAKERS who utilize Laminum in accurately fitting gear mesh and bearings do so primarily to reduce precision machining. But the same shim also assures accuracy of future service adjustments... too important to overlook. Bulletin on request

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# LAMINUM

THE SOLID SHIM THAT *peels* FOR ADJUSTMENT

## Personals

*Recent Personnel Changes and Appointments at the Plants of the Automotive and Aviation Manufacturers and Their Suppliers.*

**Chrysler Corp., Marine and Industrial Engine Divs.**—**Robert T. Keller** appointed General Manager and Vice-President, with headquarters at the Chrysler Jefferson plant.

**Packard Motor Car Co.**—**E. D. Longeneker** appointed manager of the Parts and Service Department.

**Kaiser-Frazer Corp.**, Detroit Engine

**Div.—Lloyd Harrison** appointed Production Manager; **Kenneth J. Flood** named Factory Manager and **Edward G. Lickteig**, Master Mechanic.

**Ford Motor Co., Lincoln-Mercury Div.**—**Kenneth C. Plasterer**, Head of the Division's newly created Quality Control Department.

**Indian Motorcycle Co.**—**Myron S. Falk, Jr.**, elected a Director.

**Willys-Overland Motors**—**Mark R. Dull, Jr.**, made Asst. General Manager of Willys-Overland Export Corp.

**Willys-Overland Motors**—Richmond A. Mead appointed policy and organization analyst.

**Gar Wood Industries, Inc.**—**Walter C. Robertson** made Vice-President—Export; **W. S. Blakeslee**, Sales Manager of the Wayne Div.; **John C. Moons**, elected Treasurer and a Director of the Company.

**American Bantam Car Co.**—**L. M. Scott**, appointed Acting Manager, succeeding **Francis H. Fenn**, President and General Manager, recently deceased.

**Consolidated Vultee Aircraft Corp.**—**Floyd B. Odlum**, elected Chairman of the Board of Directors.

**Boeing Aircraft Co.**—**David A. Mowrer**, Chief Service Engineer and **Airo M. Gonnella**, Asst. Chief Service Engineer.

**Northrop Aircraft, Inc.**—**John K. Northrup**, President, was elected President of the Institute of the Aeronautical Sciences.

**General Electric Co., Apparatus Dept.**—**M. H. Blesh**, Manager of Manufacturing; **C. B. Bradish**, Manager of Engineering; **E. A. Green**, Manager of Sales and **Thomas I. Hage** accountant for the Div.

**General Electric Co.**—**C. C. Walker**, elected a Commercial Vice-President.

**Stewart-Warner Corp.**—**Samuel Infull, Jr.**, elected Vice-President in charge of Radio Div.

**Federal-Mogul Service**—**Walter E. Thill**, made head of Field Engineering.

**Federal-Mogul Corp.**—**M. A. Hunter**, appointed General Manufacturing Manager.

**The Yale & Towne Mfg. Co., Specialties Div.**—**Philip A. Snyder**, General Sales Manager and **Charles E. Horne**, General Superintendent.

**United States Rubber Co.**—**Curtis L. Moody**, Factory Manager, Detroit Plant.

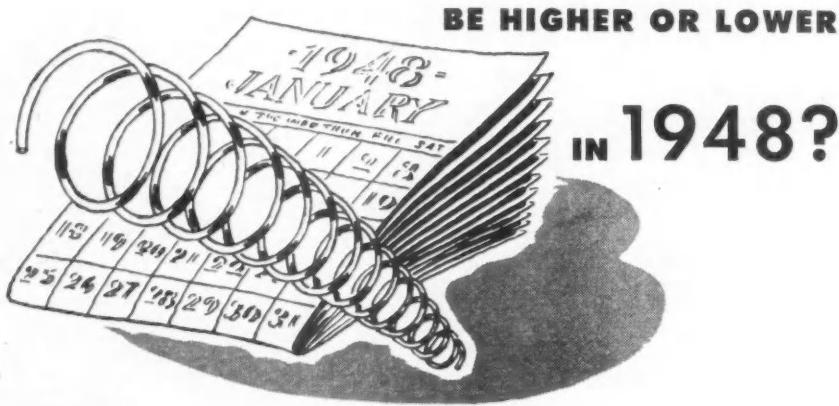
**United States Rubber Co., L. H. Gilmer Div.**—**John S. Krauss**, retiring as manager of the division, after 35 years' service.

**Bullard Company**—**Louis J. Baudis**, Chief Engineer.

**Lock Thread Corp.**—**Charles F. Newpher**, elected a Director of the company.

**Automatic Steel Products, Inc.**—**H. O. Holland**, appointed Director of Sales.

**The Euclid Road Machinery Co.**—**R. E. Keidel**, Asst. Advertising Mgr.



**A.** Higher prices on many parts and assemblies needed by the manufacturer present a serious problem in holding the price line on the finished product. Only by careful specification and purchase of materials can you achieve production economy. Unit costs can be controlled by taking advantage of the services of skilled engineers to assist you, without obligation.

Lewis Spring engineers have saved manufacturers thousands of dollars by recommending and supplying the most practical, as well as the most economical, springs for particular jobs.

Many times, Lewis engineers find manufacturers using expensive, close-tolerance springs where a more economical spring would serve the purpose just as well.

To lower your spring costs in 1948, have a Lewis representative check the spring requirements of the job to be done. He'll recommend a practical, economical spring design for you. No obligation, of course.

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**Lewis** PRECISION SPRINGS  
THE FINEST LIGHT SPRINGS AND WIREFORMS OF EVERY TYPE AND MATERIAL

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## SEE HOW AUTOMATIC TRANSFER-TYPE PROCESSING MACHINES CUT COSTS

Modern mass production requirements offer many opportunities for the use of machines of this type — on which a large number of operations can be performed, with the pieces being transferred automatically from station to station through the machine. Costs are slashed by reduction of idle time, elimination of work-handling, combination of processes, and efficient use of floor space. Greenlee has pioneered in the design and manufacture of these machines since 1934 — this booklet traces their development and illustrates outstanding examples of successful applications.



## SEE HOW LEAD-SCREW FEED ON GREENLEE AUTOMATICS CUTS COST ON PRECISION-THREADED PARTS

The numerous advantages of Greenlee Automatic Screw Machines are further enhanced by the advent of lead-screw feed — which produces precision work on threaded parts at screw-machine production rates. The Greenlee system is quickly adaptable to a wide range of work, insures uniform high-quality results, reduces scrap losses, increases the usefulness of the machine, and cuts costs substantially. The mechanism can be added to existing Greenlee machines.



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## Aircraft Know-How

(Continued from page 45)

to suspend the load from the roof. Damage from overhanging limbs of trees and other types of collisions is minimized by heavy roof construction.

Through the use of aluminum extrusion, a builder can make assemblies with a minimum of jigs and, because of the lightness of the material, can make assemblies without the use of cranes or other heavy handling equipment. Ex-

trusions can be ordered from the mill cut to exact lengths so that no further preparation is required other than mitering or drilling holes for rivets. Because of the excellent corrosion resistance of aluminum, most bodies are furnished in the natural metal finish, eliminating the necessity and expense of painting or other decorative trim.

The lightness and strength of aluminum sections make it possible to effect substantial savings in weight of aluminum bodies as compared to steel and wood bodies. The all-aluminum 35-ft semi-trailer built by the Aluminum Body Corp. weighs about 3000 lb less than a similar trailer of wood or steel.

This reduction in body weight permits an equal increase in payload without exceeding the highway loading limits. On smaller units, the savings of an aluminum body often permits the use of a lighter body than normally used for the job with other types of bodies. These lighter bodies may be responsible for savings in gasoline cost of 15 to 20 per cent. The type of construction lends itself readily to repair and maintenance. Also, because of aluminum's low modulus of elasticity, the aluminum bodies absorb shock more readily than steel and are not as apt to be seriously damaged by collision.

Aluminum is particularly adaptable to refrigerator bodies where it has other advantages in addition to its weight reduction. Because the bodies can be left unpainted, the bright metallic surface of the metal reflects up to 15 per cent more heat than a similar surface painted. The heat reflected rather than absorbed by the body lowers the cost of refrigerant considerably. Food and dairy truck operators are particularly interested in the material from which their truck bodies are made because of the sanitation requirements. Meat and other food products are not harmed through contact with aluminum, and these bodies may be cleaned as easily and with the same materials as a housewife uses to clean her cooking utensils in the home.



*It's* there . . . in clean, true lines that tell of patient seeking for perfection of strength and stamina: that "look" of champions. In a noble dog it pays off in cups, ribbons and "Best of Show." In the Aetna Bearing it pays off in silent, durable efficiency that outlasts the vehicle.

You know the trusted Aetna "T" Type Bearing . . . the recognized standard at the crucial clutch release position. It is famous for its permanent true alignment, assured by the "T" retainer; for the absence of eccentric thrust, chatter and excessive wear; for its pre-lubrication, sealed in permanently.

Aetna manufactures many types of ball and roller bearings. And a wise step, with any bearing problem, is to talk it over with Aetna Engineers. Aetna Ball and Roller Bearing Company, 4600 Schubert Avenue, Chicago 39, Illinois.

In Detroit: SAM T. KELLER, 2457 Woodward Avenue, Phone Cadillac 2040

# Aetna



## BALL & ROLLER BEARINGS

## Tractor Industry

(Continued from page 31)

longest strikes, one of which had continued more than a year and another of nine months' duration, were settled early in 1947. Since that time, most strikes were settled without much lost time, three such settlements having been made last month. Several companies will have new contracts up for negotiation in May.

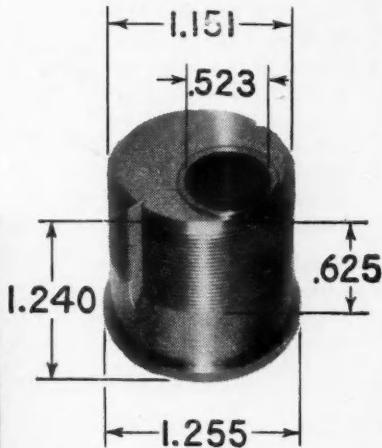
### Price Increases Conservative

Prices will show some advances for 1948, but they will be conservative as they have been throughout the postwar period. The industry has prided itself that its products have been priced consistently lower than those of any other industry manufacturing comparable durable goods. Increases following the removal of controls have been held between 25 and 30 per cent throughout 1947. Because of the increases in steel and coal, some readjustments have been necessary for 1948. The average index will be 135 to 140 as compared with a prewar 100. This compares with a farm commodity price index exceeding 270 for the same period. Total farm income for 1947 is expected to exceed \$32 billion, and prices for most farm crops will be supported at 90 per cent of parity throughout 1948. On these bases tractors and farm equipment prices are the lowest in history in their relationship to farm commodity prices.

# NEW BRITAIN AUTOMATICS LOWER BREAK-EVEN POINT ON THIS PIECE . . .

By

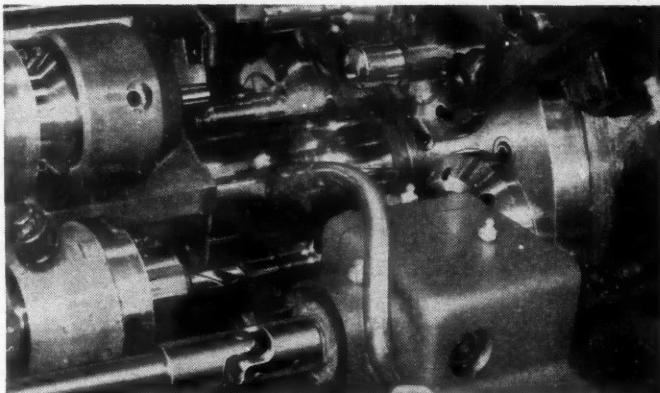
**Eliminating 2nd operations  
Reducing time and labor costs  
Increasing production rate over 100%  
Improving quality of product  
Reducing material cost**



A leading manufacturer formerly turned out the lock cylinder case illustrated from castings on five separate machines, each of which required a full time operator. Searching for more profitable production, he decided to investigate the possibility of automatic machinery.

By stopping the spindles and using eccentric drilling, plus milling attachments, New Britain engineers were able to put the entire job on one of our new model 601 Automatics using bar stock instead of costly castings. Production is maintained at 613 pieces per hour (5.8 secs. per piece), and the operator can easily take care of two other machines.

Eight operations plus cut-off are necessary to complete the piece. The spindle is stopped in the 4th position where the V slots are milled while the eccentric drilling attachment drills the main cylinder hole. Because specifications require the



closest alignment between the two slots and the eccentric hole, the spindle is indexed to the 5th position without changing the alignment. In the 5th position the main cylinder hole is reamed while a cutter faces the end of the piece leaving a shoulder around the hole.

For a practical solution to mounting manufacturing costs . . . let New Britain engineers point the way to lowering the break-even point in your plant. Write today for your copy of "Cost Histories" which describes many specific approaches to more economical manufacturing.  
*Productivity, not price, is the measure of a machine.*  
**NEW BRITAIN AUTOMATICS COST LESS PER FINISHED PIECE**

148HC1



## NEW BRITAIN

*Automatics*

THE NEW BRITAIN MACHINE COMPANY  
NEW BRITAIN-GRIDLEY MACHINE DIVISION  
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The NEW Strand Rotoflex 4-speed gear drive Flexible Shaft Machine (shown upper right) is another step forward in Strand quality precision tools for faster, easier, more economical production work. The Rotoflex 4-speed gear drive employs a patented, new type of quick change gear drive utilizing 4 positive speeds by a unique and easy method of instantly changing from one speed to another. Rotoflex machines are powered with totally enclosed ball-bearing motors having speeds from 850 to 9000 R.P.M., depending on motor.

Standard type Strand machines, (lower right) give portable rotary power at constant speeds with dependable results in all grinding, buffing, drilling, wire brushing and rotary filing operations. Hundreds of types and models from  $\frac{1}{6}$  to 3 H.P. available with suitable attachments for your specific requirements.

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### This Business of Making Holes

Probably the making of holes in one way or another accounts for more machining operations in the metal-working industries than any other type of stock removal. Mass production cannot be maintained unless fast, accurate equipment for the precision machining of holes is on the job constantly. That is why, since 1901, metal-working shops have been using MOLINE HOLE HOG cost-reducing equipment in production work.

For such operations as Boring, Milling, Straight Line Drilling, Universal Adjustable Spindle Drilling, Honing, Tapping, Reaming and Counterboring, or for ANY special problem, a Moline "Hole Hog" can do it for you faster at less cost.



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Moline, Illinois

### Business in Brief

Written by the Guaranty Trust Co., New York, Exclusively for AUTOMOTIVE INDUSTRIES.

Further advances in general business activity are indicated. The *New York Times* index for the week ended Dec. 6 rose to a new peak of 155.4, as against 150.8 for the preceding week and 136.6 a year ago.

Sales of department stores during the week ended Dec. 6, as reported by the Federal Reserve Board, equaled 507 per cent of the 1935-39 average, as compared with 367 in the week before. Sales were seven per cent above the corresponding distribution a year earlier, as against a preceding similar excess of 10 per cent. The total in 1947 so far reported is eight per cent greater than the comparable sum in 1946.

Electric power production increased slightly in the week ended Dec. 6. The output was 11.7 per cent above the corresponding amount in 1946, as compared with a like advance of 12.0 per cent shown for the preceding week.

Railway freight loadings during the same period totaled 878,588 cars, 10.9 per cent more than the figure for the week before and 20.5 per cent above the corresponding number recorded last year.

Crude oil production in the week ended Dec. 6 averaged 5,264,789 barrels daily, or 7539 barrels more than the preceding average and 570,039 barrels above the comparable output in 1946.

Production of bituminous coal and lignite during the week ended Dec. 6 is estimated at 13,300,000 net tons, 11.1 per cent more than the output in the week before. The total production in 1947 so far reported is 17.6 per cent above the corresponding quantity in 1946.

Civil engineering construction volume reported for the week ended Dec. 11, according to *Engineering News-Record*, is \$95,623,000, or 55 per cent less than the preceding weekly figure and 25 per cent below the comparable sum in 1946. The total recorded for 50 weeks of this year is eight per cent more than the corresponding amount in 1946. Private construction is one per cent below that a year ago, but public construction has increased by 22 per cent.

The wholesale price index of the Bureau of Labor Statistics for the week ended Dec. 6 is 161.0 per cent of the 1926 average, as compared with 159.8 for the preceding week and 139.1 a year ago.

Member bank reserve balances increase \$94 million during the week ended Dec. 10. Underlying changes thus reflected include a decrease of \$213 million in Reserve bank credit and a reduction of \$332 million in Treasury deposits with Federal Reserve banks, accompanied by an advance of \$57 million in money in circulation.

Total loans and investments of reporting member banks decreased \$15 million during the week ended Dec. 3. An increase of \$91 million in commercial, industrial and agricultural loans was recorded. The sum of these business loans, \$14,358 million shows a net increase of \$3105 million in 12 months.

These

10

## FELT FEATURES

*Give you your Versatile design material*

### 1 Felt

Is adaptable, easy to design into a product . . . comes in many densities, thicknesses and qualities.



2 Cuts with a clean, non-fray edge . . . can be die-cut, punched, skived, chiseled, turned, scarfed or otherwise processed.



3 Highly resilient . . . retains usefulness longer under tough operating conditions that cause lesser materials to break down.



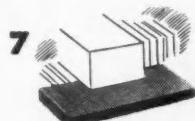
4 High breaking point . . . tightly interlocked fibres give felt its unusual tensile strength.



5 Not affected by normal atmospheric conditions . . . sun, moisture, heat or cold.



6 Deadens noise effectively . . . its desirable acoustical properties make felt widely popular for this application alone.



7 Excellent coefficient of friction . . . effective with wood, glass, metal, or almost any other material.



8 High capillary value . . . makes felt ideal for wicking and filtering.



9 Easily cemented . . . adhesives available (stronger than felt itself!) that insure a firm bond between felt and other materials.



10 Wide price range . . . priced from 17c to \$60 and more per square yard, felt's a material that fits budgets as well as blueprints.

### 11

Yes, we did say "10", but there's a big 11th advantage you get when you buy cut felt parts from The Felters Company . . . your parts are uniformly and accurately cut to your exact size and shape specifications—they're usually ready for assembly after a single, elementary operation. This will reflect a substantial bonus in time-saving for you.

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Offices: New York, Philadelphia, Chicago, Detroit.

Sales Representatives: San Francisco, St. Louis.

*Makes the Felt for the Parts it Cuts*

## Ford Tractor

(Continued from page 39)

individual piece of sheet metal. The vendor fills the racks at his plant, ships the parts in the racks to the Highland Park plant. There the racks are removed by fork trucks and delivered to storage ready for use on the final assembly line.

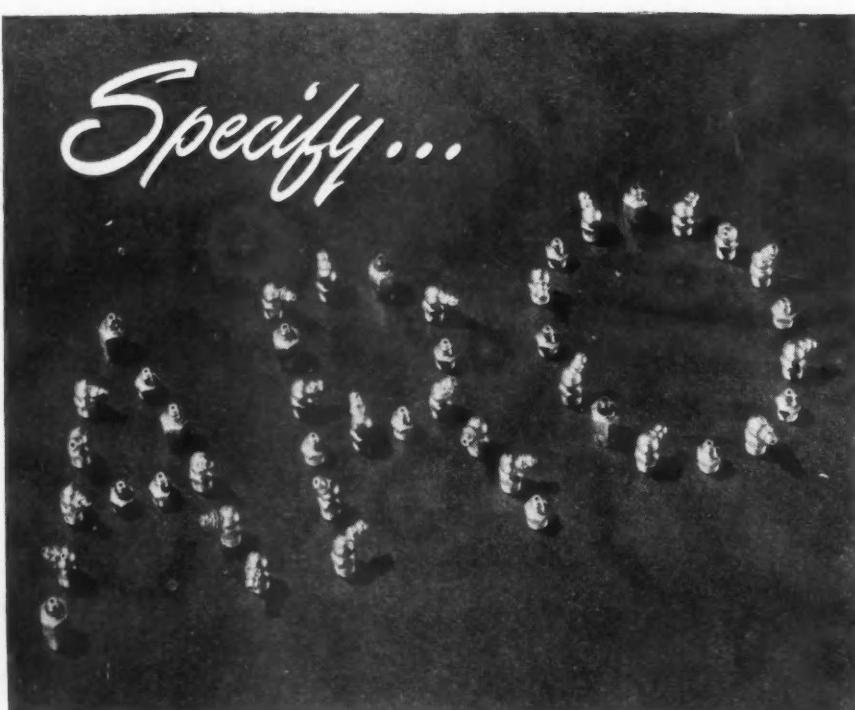
The maximum loading of freight cars with best economy was also given considerable study. Ordinarily the standard car takes eight tractors on its floor, leaving all of the overhead

space a total waste. A little investigation revealed that a car of double-deck construction—with a floor panel about half-way up—could easily accommodate 16 tractors at a time. Some cars of this type already have been made available and have been put to good use. Loading of the second tier presented a problem that was solved by means of specially designed loading device. It consists of a portable ramp leading up to a platform, the latter being provided with a turn-table. The tractor is run up onto the platform under its own power, turned side-wise on the turn-table, then rolled into the car.

With the foregoing as a background,

we may summarize the principal materials handling methods and practices in the tractor plant as follows: industrial fork trucks are widely used for unloading trucks and freight cars and transporting incoming materials to storage as well as to the start of machine lines; gravity roller conveyors are used to link machine operations and also serve as loading stations at the start of machine lines; monorail conveyor lines are employed extensively for transporting material and parts along machine lines and to assembly lines; power drive chain conveyors are arranged for sub-assembly and assembly lines; electric hoists are used throughout the plant to facilitate the movement of heavy parts and sub-assemblies.

The plant has a total of approximately 6900 feet of conveyors. The main inter-plant conveyor, mentioned above, is 2955 feet in length. It carries cylinder blocks, transmission housings, rear center housings, axle housings, oil pans, cylinder heads, and various smaller parts. The conveyor which transports wheels and tires from box cars to the assembly line is 807 feet long. A 360-foot conveyor line transports gears from the machine shop to the heat treating department. The conveyor carrying assembled engines and transmissions to the final assembly line runs 482 feet.



## Precision-Made GREASE FITTINGS for Original Equipment

Get the right grease fittings for every lubrication point—specify ARO! They're accurate... rugged... dependable!

Aro Grease Fittings are new in design. The lower half of head is machined to a perfect spherical shape so that coupler jaws insure a tight, leak-proof seal. Upper half of fitting head is machined concave to permit an easy disconnect of coupler jaws—resulting in less wear on jaws and fittings. Made of specially hardened steel with machine-cut threads for accuracy. Complete range of types and sizes. Write for details. The Aro Equipment Corporation, Bryan, Ohio.

**ARO**

LUBE EQUIPMENT AND AIR TOOLS  
FOR AUTOMOTIVE SERVICE...  
INDUSTRY...FARM

## Plant Expansion

(Continued from page 28)

a Forge plant in Ohio and seven former government buildings at the Rouge, including the aircraft engine plant, and has leased the Naval Arsenal at Detroit. It is estimated that total Ford expenditures since the end of the war for building, expansion, and modernization, and tooling for new models approximates \$250 million.

Chrysler reveals that since the war it has added about 2 million sq ft of floor space through purchase of buildings and added another 1.5 million through construction, all at Detroit. In addition, construction of an addition to its San Leandro plant for assembly of Dodge cars and trucks and a new parts plant at Newark, Del., will be completed soon, adding another 750,000 sq ft for a total of about 4.2 million sq ft of additional space since the war.

Kaiser-Frazer in the last year has added considerably to its holdings. It acquired a steel mill at Indianapolis, a foundry at Dowagiac, Mich., and an interest in a steel mill in Ohio. In addition, it leased the Detroit plant of Continental Motors Corp. for its Engine Division. Total expenditures for K-F for facilities, tools and dies, subsidiary plants, and interests in sources of supply are estimated at close to \$43 million.

(Turn to page 78, please)

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 in fact as well  
 as in name...  
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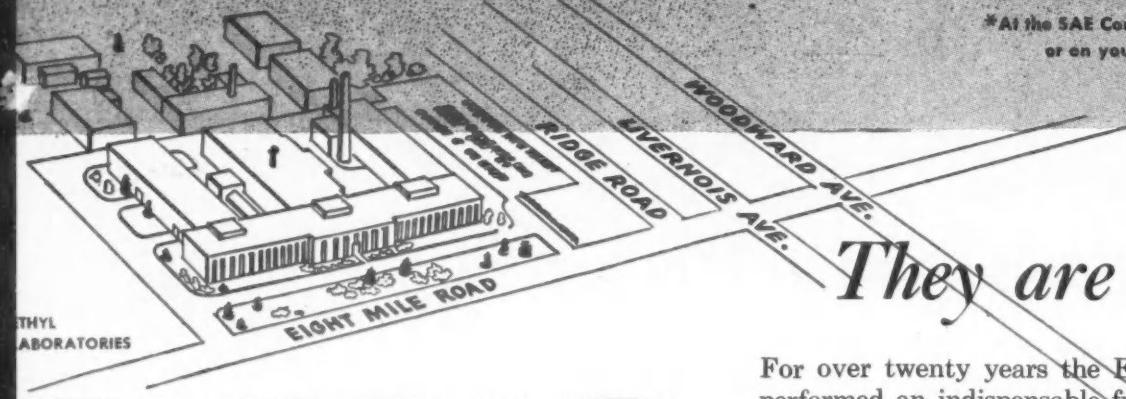
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 METALS DIVISION

AMERICAN SMELTING AND REFINING COMPANY  
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\*At the SAE Convention (Jan. 12-16)  
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*They are designed*

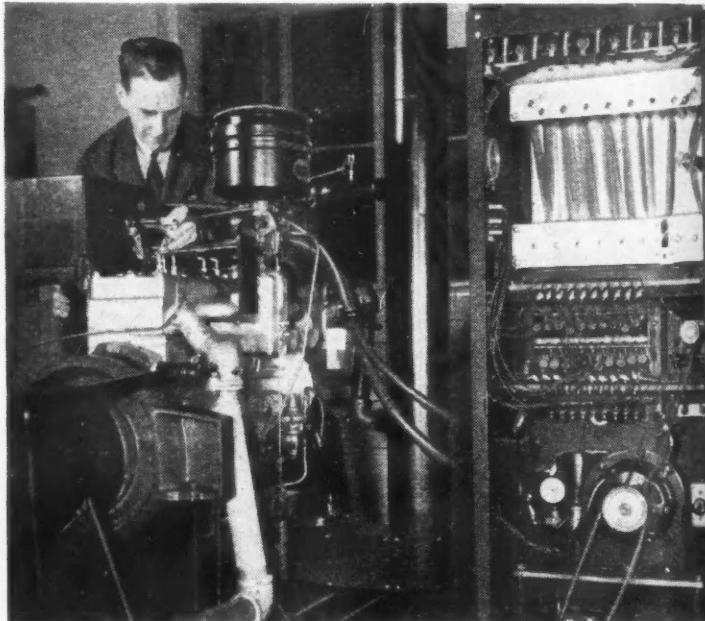
For over twenty years the Ethyl Laboratories have performed an indispensable function in the organized research of the automotive and oil industries, which continuously brings better and more economical automotive transportation to the American people.

The present modern laboratories incorporate much

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A view of Detroit's fine shopping district—looking up Washington Boulevard.



**THIS PLASTIC HIGHWAY** enables Ethyl engineers to "bring the road into the laboratory." A combination engine and dynamometer control makes it possible to duplicate on the dynamometer stand the sequence of engine speed and loading recorded during any actual trip on the highway. The control equipment utilizes a plastic tape and operates on the principle of the familiar player piano.

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CORPORATION**



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## *to serve the oil and automotive industries*

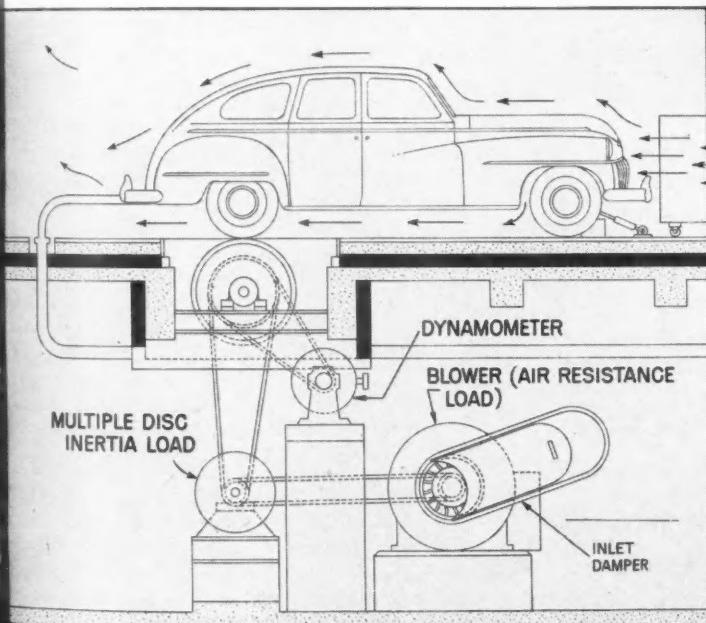
special equipment with many unique features which are of interest to technical people in petroleum and automotive companies.

New tools and techniques are continuously being developed at Ethyl Laboratories for the express purpose of better solving the interrelated problems of engines,

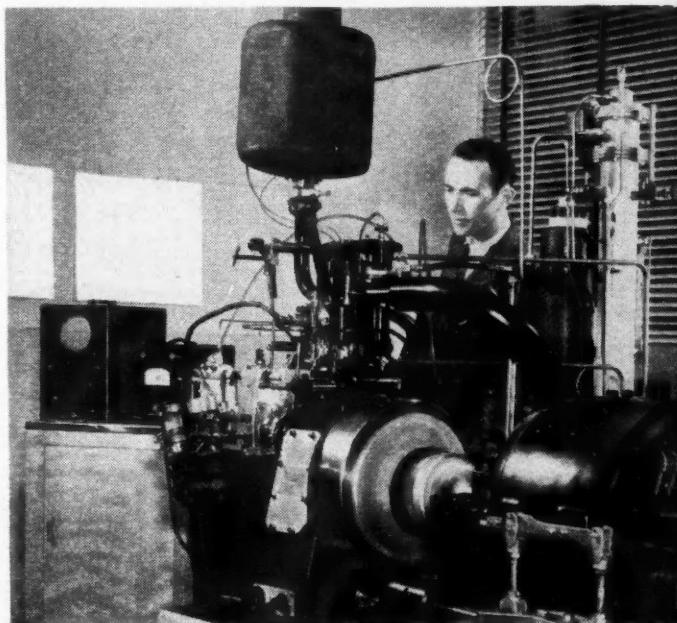
fuels and lubricants, in the never-ending search for better and more economical fuels.

Ethyl Corporation cordially invites technologists of oil, automotive and related companies to inspect the Ethyl Research Laboratories and to discuss problems of mutual interest.

### SPECIAL EQUIPMENT IN THE ETHYL LABORATORIES



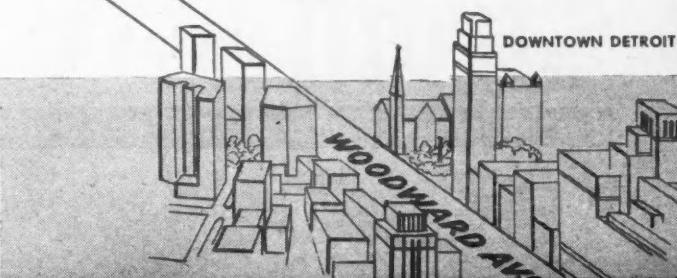
**INDOOR "ROAD" KNOCK RATINGS** may now be obtained on the rolls of this chassis dynamometer provided with special automatic control equipment developed by Ethyl Laboratories. Speed-time relationships for accelerations run on these rolls duplicate those obtained on the road. Knock ratings made on the rolls are essentially the same as those made on the road, and their reproducibility is better.



**SPECIAL SINGLE-CYLINDER ENGINE** studies indicate fuel antiknock performance under conditions including wide ranges of speed, manifold pressure and compression ratio. The extreme flexibility of this special engine makes it possible to rate experimental fuels under conditions which appear likely to exist within the cylinders of engines of the future.

### RESEARCH LABORATORIES

1600 West Eight Mile Road, Detroit 20, Michigan  
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## Plant Expansion

(Continued from page 74)

Studebaker last year also moved to expand its facilities. The company bought the large aircraft engine plant it operated for the government at South Bend during the war and will use it for manufacture of automobile parts. The price was \$3.592 million. It also bought the Empire Steel Corp. at Mansfield, Ohio, for \$7.43 million to assure a steady supply of steel for expanded production of cars. A Canadian plant is under construction and is expected to

be in production by spring or early summer.

Hudson has done very little in the way of plant expansion, but has completed a modernization program in connection with tooling up for its new model. Cost of the tooling and equipment program was in the neighborhood of \$16 million.

Willys-Overland has practically completed its \$21 million postwar expansion program. In addition to modernizing existing facilities, the company put into operation last year a \$5 million stamping plant and a \$1.3 million forge shop. It also resumed production at its West Coast branch as-

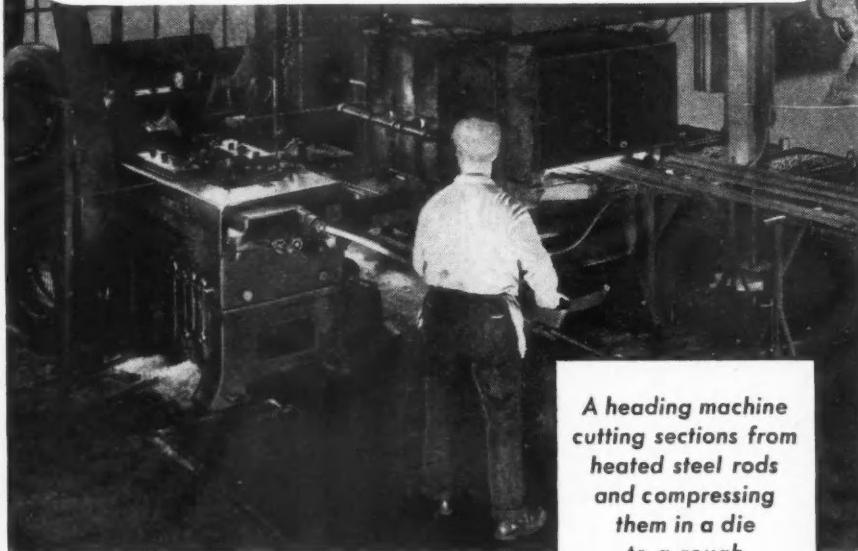
sembly plant at Maywood, Calif., near Los Angeles.

Nash has expanded its facilities at Kenosha and Milwaukee, and has purchased a plant in California and one in Toronto, neither of which is operating yet. However, both units are expected to get underway this year. The company also has established distributor assembly plants in Mexico, Brazil, Argentina, and Sweden.

Packard has substantially completed its \$20 million postwar expansion project which included tooling the 1948 models. Considerable modernization has been done at the home plant, including erection of an addition to house a second assembly line. New machinery, including transfer machines, has been installed. Packard is currently erecting an office and warehouse building in Windsor, which also might some time be used for assembly. It also has purchased from the government an aircraft engine building on its own property which is used for offices and for conditioning cars.

### This is How

#### STROM BALLS are Born



A heading machine cutting sections from heated steel rods and compressing them in a die to a rough spherical shape

The steel is carefully chosen and inspected, even before it gets to the heading machine. After being "born" here, balls are carefully "brought up," through a long series of grinding and lapping operations, to the unbelievably high standards of finish, sphericity and precision which have made Strom Metal Balls the standard of Industry. Strom Steel Ball Co., 1850 South 54th Avenue, Cicero 50, Illinois.

**Strom** BALLS Serve Industry

Largest Independent and Exclusive Metal Ball Manufacturer

### Panther Jet Fighter

(Continued from page 42)

racing designers of the thirties, sought an answer to the fact that jet engine power is a function of the airspeed of the airplane, varying directly with increased speed. This speed increased the pressure ratio and decreased the velocity ratio of the jet intake system, thereby producing the increased power and efficiency. They recognized that the speed of the incoming air need not be merely the speed of the airplane and that by "ventilating" the interior of the engine compartment and inducing a high velocity flow through it, the speed of the incoming air to the turbojet compressor could be raised considerably over the speed of the airplane, particularly at low speeds, where pressure ratios are low and velocity ratios extremely high and inefficient. Another advantage of this system is that "lower lip stalling," a condition resulting from the intake duct being pitched up at a high angle, such as during landing, is effectively prevented, thereby preserving the flow into the engine at slow, high angle conditions of the airplane. This permits a rapid climb from a waveoff aboard a carrier, nemesis of conventional jets.

Droop snoot wing leading edge panels which lower forward comprising nose flaps are unique features of the Panther. In combination with large trailing edge slotted flaps, this arcing of the nose produces an extremely high effective camber, which in turn results in high lift coefficients permitting slow landing speeds. This feature, originated and developed in Germany during the war, is a promising new development in high

(Turn to page 80, please)

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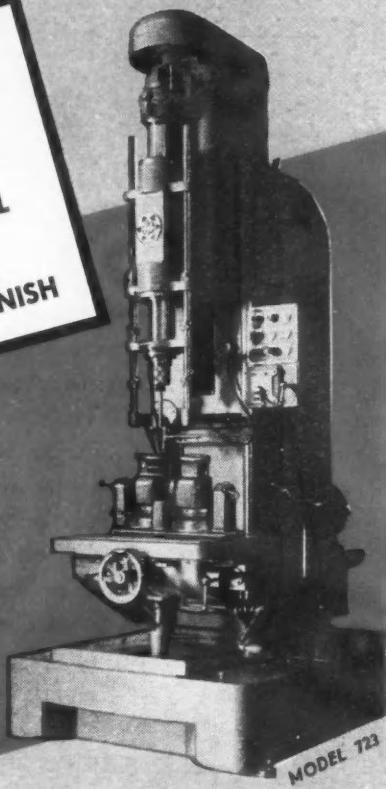
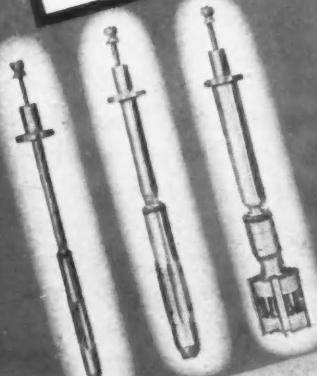
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## Panther Jet Fighter

(Continued from page 78)

speed aircraft design in that it permits a single wing to comprise a highspeed wing in the air and a lowspeed wing for landing, an ideal aerodynamic arrangement sought by engineers for 40 years.

Three prototype XF9F-2 fighters will be built, followed by a production order for 30 in which P&W Nene and Allison J-33 engines will alternate. A contract for 100 is now under negotiation, with the Navy Bureau of Aeronautics stipulating additional quantities in 100 increments, as supplements dependent upon Congressional appropriations. Already in quantity production on a recent additional contract for F8F-2 Bearcat reciprocating engine fighters, Grumman does not plan acceleration of the F9F program, but rather a smooth dovetailing of the schedule into the deceleration of F8F production.

## Automobile Industry

(Continued from page 27)

ally built one or more cars and some of which are still in the planning stage.

Another development among the newcomers to the industry is the rapid rise of Kaiser-Frazer during the last year from 17th place in a field of 19 at the end of 1946 to the leading passenger car producer among the independents at the close of 1947. If the total of Kaiser and Frazer cars is taken as a unit, the company also led several divisions of the Big Three, including Chrysler, DeSoto, Cadillac, Lincoln, and Mercury. However, if production of Kaiser and Frazers are listed separately, they would fall behind Chrysler, DeSoto and Mercury. Nonetheless, K-F has done a remarkable job production wise, through obtaining materials by purchase or lease of sources of supply.

### Price Changes in 1947

Automobile and truck prices climbed considerably during 1947 as labor and other costs continued to mount. The only deviation from the pattern was a price decrease in some models by Ford in January and Plymouth in April, but both of these subsequently were restored and higher tags added. A recent tabulation showed that on last Sept. 1 the price of cars varied from 35 to 87 per cent above the level of Jan. 1, 1940. However, the general opinion is that the end is not yet and prices may go up as much as another 6 to 10 per cent this year, if a third round of wage increases is granted, as now seems likely, and other costs go up in proportion. Tooling costs for new models is at least

(Turn to page 82, please)



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# Automobile Industry

(Continued from page 80)

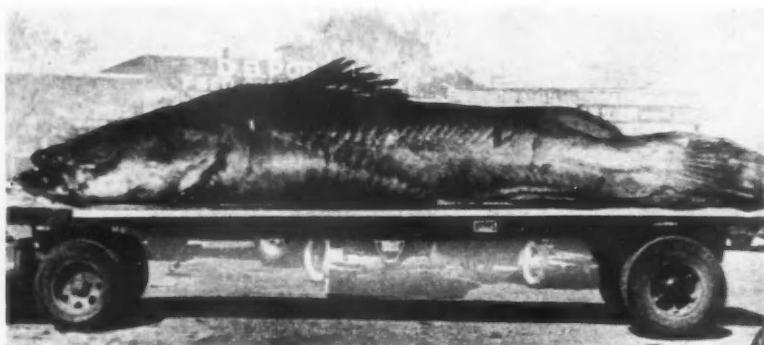
twice what it was before the war, and some companies say it is nearly three times as high. At the close of last year, Hudson raised the price of its new model by 11 per cent over the previous one. Nash and Studebaker also raised prices moderately on introduction of 1948 models late in the year, although the cars were not changed to any extent.

## Export Shipments

The export shipment of automobiles during 1947 remained fairly constant, although toward year-end it showed a slightly dropping off. During the first nine months of 1947 the industry sent 7.8 per cent of its passenger cars and about 22 per cent of its trucks abroad, which is about the same ratio as in pre-

war years, but in the last quarter car exports dropped to 4 per cent and trucks 18 per cent. However, there has been a decided shift in the foreign market since 1939, the last normal export year. During the first seven months of last year, the top ten customers for U. S. cars were Canada, Union of South Africa, Argentina, Brazil, Mexico, Belgium, Sweden, India, Netherlands, and Venezuela. In 1939, the top ten countries were Union of South Africa, Canada, Australia, Argentina, Sweden, Belgium, Brazil, Mexico, Colombia, and British India. One disturbing factor that occurred during the year was the increasing number of countries that placed either outright embargoes or quota restrictions on the importation of American automobiles in order to protect dollar exchange. While not a very important factor at the moment when the industry can sell all the cars it can make at home and in non-restricting countries, it could assume a serious aspect in the future when the domestic market is satisfied. Even Mexico and Canada have embargoed importation of completed cars. The outlook for foreign markets is considered best in the South American countries, with Europe and the Far East poorest.

## When bigger catfish are caught Tuthill Springs can carry 'em!



**W**HEN Bill Grace goes fishing, he doesn't fool with the little ones. —Or so he says. Bill is General Manager for Hobbs Mfg. Co., of Fort Worth, Texas. His job is to make trailers. Once in a while, though, he gets in a little fishing on the Leon River.

You might suspect Bill of a little exaggeration because he is a Texan. However, he sent us this photo. It would almost seem to prove his fish story. That trailer under the catfish is a Hobbs.

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## Improved Labor Relations

In the field of labor relations, 1947 was far better than 1946, when strikes and mandays lost reached an all time peak. The automotive industry was relatively free of strikes all year, and those that occurred were of short duration involving only a small number of men. Labor relations directors in the industry expect that 1948 also will not see any great disturbance of the present status, although demands for wage increases are expected to come soon.

The year saw several developments in labor, the principal ones being the portal-to-portal pay suits, a general pay increase of 11½ cents per hour plus six paid holidays, the proposal of a pension plan by Ford, enactment of the Taft-Hartley Act, and the anti-communist purge of the UAW-CIO which resulted in a clean sweep for Walter Reuther and his slate of candidates. Portal suits were practically banned by Congress and at year-end were of no consequence. Defeat of the pension proposal by Ford workers certainly has made such demands much more difficult for the union, although they are expected to be brought out again in the General Motors negotiations this April. By all odds, the most profoundly important labor development of the year was the passage of the Taft-Hartley Act despite frantic attempts by organized labor to defeat it. The general belief is that the new labor law, together with better discipline in the union as a result of the Reuther victory, greatly improves chances for settlement of labor problems without strikes in the year ahead.

# PRODUCTION UP 25% to 40%

## with ARO tools on assembly lines



Aro Impact Screw Driver Model 131 drives No. 8 screws to fasten casters to frame of food conveyor.

Fastening handles to Roasterette body with No. 8 screws driven into clip. Aro Model 22LPH.



Fastening trim bands and reflector assembly to room heater body. Aro Model 22LPH Screw Driver.

At left, driving No. 8 screw to attach handle on griddle. Aro Model 22LPH. At right, Aro Model 3012 Nut Setter drives No. 8 nut in broiler unit.

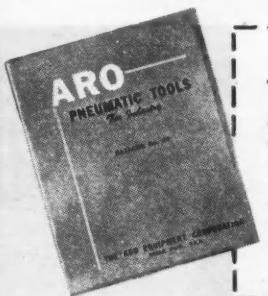


The Swartzbaugh Manufacturing Co., Toledo, Ohio, makers of Everhot electrical products, installed Aro screw drivers, nut setters, drills and grinders on assembly lines. Production went up 25% to 40%!

This is one of many companies Aro field engineers have helped to find *faster* and *better* ways to handle tough assembly jobs. Why not let our trained engineers check your assembly problems? Just write or wire... The Aro Equipment Corp., Bryan, Ohio.

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## General News

(Continued from page 23)

### Automobile Old Timers Name 1948 Nat'l Committee Chairmen

In reporting that 1947 was the organization's most prosperous year since its inception in 1939, the Automobile Old Timers announced the appointment of the following national committee chairmen for 1948: Frederick O. Bezner, finance and budget; Henry R. Selden, research and awards; Ralph De Palma, mem-

(Turn to page 86, please)

## Ford Engine

(Continued from page 46)

hemispherical combustion chambers, has been raised to 7.1 to 1 from the standard Ford ratio of 6.4 to 1. Water jacketing of the new design is arranged so that cooling water is circulated around the valve seats and spark plugs.

A fuel trap is provided at the bottom of each carburetor. The downdraft induction system is claimed to provide excellent fuel mixture and, in combination with the large intake valve, to hold pumping losses to a minimum, resulting in unusually high volumetric efficiency. Fuel distribution is reported to be satisfactory for all settings, from slightly rich to very lean.

The radially-inclined valves are guided in replaceable phosphor-bronze bushings and operate against replaceable hard aluminum-bronze seats. Both valve heads are tulip shaped, and have large stems of 0.375 in. diam. The intake valve head has a diam of 1.875 in. Dual valve springs are used. The rocker arms are Ni-Cr-Mo steel. Pressure lubrication is provided to the valve shafts, and adjustment can be made at the rocker-arm end of the push rod. Other parts of the modified engine, including ignition, spark plugs, oil system, connecting rods and bearings, are of standard Ford design.

Parts necessary for this modification are not in production at the present time; however, the Arduin Mechanical Corp. estimates that the complete assembly kit, if mass produced in a volume of 10,000, could be sold for approximately \$150. Additional weight added to the standard engine by the modification would be approximately 10 lb, Arduin estimates.

Performance curves, comparing bhp and torque of the standard Ford engine with that claimed for the Arduin, are given in Fig. 2. Specific fuel consumption figures are not available, although it is claimed that the improved thermodynamic characteristics would result in lower specific fuel consumption.

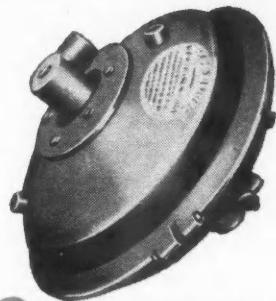
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**Easier to Mount**—connects only to hydraulic line and intake manifold.

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At dangerous railroad crossings . . . in countless driving emergencies in city, town, and country . . . in all kinds of weather . . . buses daily **MUST** stop **SAFELY** to protect the precious lives of America's 30 million school children. Kelsey-Hayes famous "Vacdraulic" power brake units provide that kind of protective braking for school buses, as well as for all other vehicles, from smallest passenger cars to the largest trucks and buses. "Vacdraulic," product of many years of Kelsey-Hayes engineering "Know-How," gives the driver a perfect "brake-feel," and requires only a "feather-touch" on the brake pedal for perfect control at all times. Phone or write for complete information on how "Vacdraulic" can do a better braking job for you.



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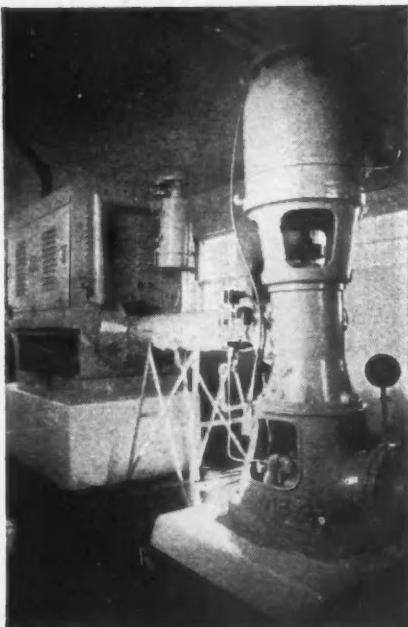
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Layne Well Water Systems whether installed for cities, factories, railroads, irrigation projects or other use, keep water production at the very lowest cost. Furthermore Layne associated companies constantly provide prompt repair and parts service for their Layne installation. For late catalogs, address Layne & Bowler, Inc., General Offices, Memphis 8, Tennessee.

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## General News

(Continued from page 84)

bership; John F. Creamer, admissions; Reginald M. Cleveland, magazine publication; George H. Robertson, racing drivers; Mrs. Gertrude S. Fenner, women's division, and William A. Smith, representative on the national advisory council. Three new membership divisions were also created: eastern, central and western.

To plan the organization of a Michigan State Council, a new committee was appointed consisting of Harvey J. Campbell, Ernest R. Breech, William G. Bryant, Charles T. Bush, Henry T. Ewald, Joseph W. Frazer, Richard Harfst, George W. Mason, George Romney, George M. Slocum and Fred M. Zeder.

### To Present 50 Papers At SAE Annual Meeting in Detroit

Aircraft powerplants, diesel engines, trucks and buses, transportation and maintenance, aircraft, fuels and lubricants, tires, air transportation, production materials, are included among the subjects of nearly 50 technical papers which will be presented at the SAE Annual Meeting and Engineering Display, Jan. 12-16 in Detroit.

### MEMA Elects 1948 Officers

At a recently held meeting of the Board of Directors of the Motor and Equipment Manufacturers Association, the following were elected as MEMA 1948 officers: President, Alfred E. Keough, John T. Stanley Co., New York, N. Y.; Vice President, Bert G. Cochrane, Casco Products Corp., Bridgeport, Conn.; Secretary, Week M. Albaugh, Thompson Products Inc., Cleveland, O.; Treasurer, Clyde P. Brewster, K-D Manufacturing Co., Lancaster, Pa.

The MEMA 1948 Board of Directors follows: W. M. Albaugh, Thompson Products Inc., Cleveland, O.; J. W. Anderson, The Anderson Co., Gary, Ind.; H. B. Barrett, Barrett Equipment Co., St. Louis, Mo.; B. G. Cochrane, Casco Products Corp., Bridgeport, Conn.; Edw. Gammie, Victor Mfg. & Gasket Co., Chicago, Ill.; G. H. Goehrig, Blackhawk Manufacturing Co., Milwaukee, Wisc.; A. E. Keough, John T. Stanley Co., New York, N. Y.; C. O. Kleinsmith, National Carbon Co., New York, N. Y.; F. A. Miller, U. S. Asbestos Div. Raybestos-Manhattan, Manheim, Pa.; C. J. Schuepbach, Sunnen Products Co., St. Louis, Mo.; F. G. Wacker, Amoco Tools Inc., North Chicago, Ill.; S. B. Wilson, Fram Corp., Providence, R. I.

### Labor Got 76% of Net Income Of Manufacturing Origin In '46

Of net income originated by manufacturing before payment of corporate taxes, 76.3 per cent was received by factory employes in 1946 as contrasted with 66 per cent in 1941 and 75.7 per cent in 1939, according to the National Industrial Conference Board. Net income originating refers to the Department of Commerce concept of national income and differs from net income on a profit and loss statement. Net income originating includes not only the net return to the companies, but also compensation of employes, rent and interest payments.

### Zimmer Boat & Trailer Buys National Trailer, Elwood, Ind.

Zimmer Boat & Trailer Co., Detroit, has purchased the National Trailer Corp., Elwood, Ind. Leonard Griffin, Detroit, will be general manager of the Elwood plant under the new ownership.

### Elect Northrop President of Inst. of Aeronautical Sciences

John K. Northrop, president, Northrop Aircraft, Inc., was recently elected president for 1948 of the Institute of the Aeronautical Sciences. Mr. Northrop's formal induction into office will be at the 16th annual meeting, Jan. 26-29, New York City. Other officers elected by the I.A.S. Council were as follows: vice-presidents for 1948, Clarence L. Johnson, chief research engineer, Lockheed Aircraft Corp.; Smith J. de France, engineer-in-charge, Ames Aeronautical Laboratory, National Advisory Committee for Aeronautics; R. P. Lansing, vice-president-group executive, Bendix Aviation Corp.; and Earl D. Osborn, president, Edo Corp. The 1948 treasurer is Sherman M. Fairchild, Sherman Fairchild & Associates. Reelected were S. Paul Johnston, director; Bennett H. Horchler, executive vice-president; Robert R. Dexter, secretary; Joseph J. Maitan, controller.

### Oil Industry Develops a New 115/145 Grade Super Fuel

Agreeing to furnish 1,940,000 barrels in the second half of 1947, the oil companies able to supply it have revealed a new super fuel known as the 115/145 octane grade, which has distinct advantages over the 100/130 octane grade. The new fuel is said to make possible estimated increases of 12 to 15 per cent in the power of reciprocating engines of the latest design used in military aircraft. (Turn to page 88, please)

# GUNITE ...

## ...TRUCK WHEELS

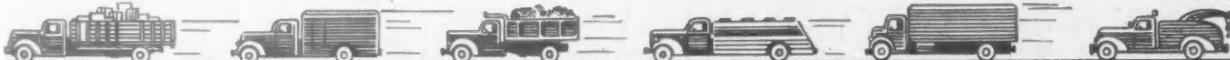
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TO FIT MANY POPULAR  
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*Gunite Wheels include Gunite Brake Drums*

This picture shows GUNITE CAST WHEELS installed front and rear on a standard chassis manufactured by Federal Motor Truck Co., Detroit, Mich.

The GUNITE LINE of Cast Wheels now includes the two types shown above—Truck Fronts and Truck Dual Rears. Advantageous design features include continuous web with spoked appearance, large non-slip lugs on floating bolts, straight-line stress transfer from rim to bearing, ventilated spacer (on rears), famous Gunite Brake Drum an integral part of the assembly, and accurate machining for proper fit on standard types of axles. Made of strong, tough, controlled-quality cast steel (except 20" fronts, which are malleable iron). GUNITE Wheels give you greater strength, greater safety, greater durability. *Buy GUNITES—for better trucking!*

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## General News

(Continued from page 86)

## Obituary

### Joseph C. Davidson

Joseph C. Davidson, 53, plant manager, Chester, Pa., assembly branch, Ford Motor Co., died on Dec. 10 after a long illness.

### Louis Delage

Louis Delage, 73, famous French automobile manufacturer, died suddenly on Dec. 14 in Paris.

### Norris R. Buckingham

Norris R. Buckingham, vice-president and general manager, Atlas Drop Forge Co., Lansing, Mich., died suddenly on Dec. 12, in Lansing.

### Horace T. Thomas

Horace T. Thomas, 73, former chief engineer, vice-president, and director for many years of the Reo Motor Car Co., died Dec. 20 in Lansing, Mich.

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